

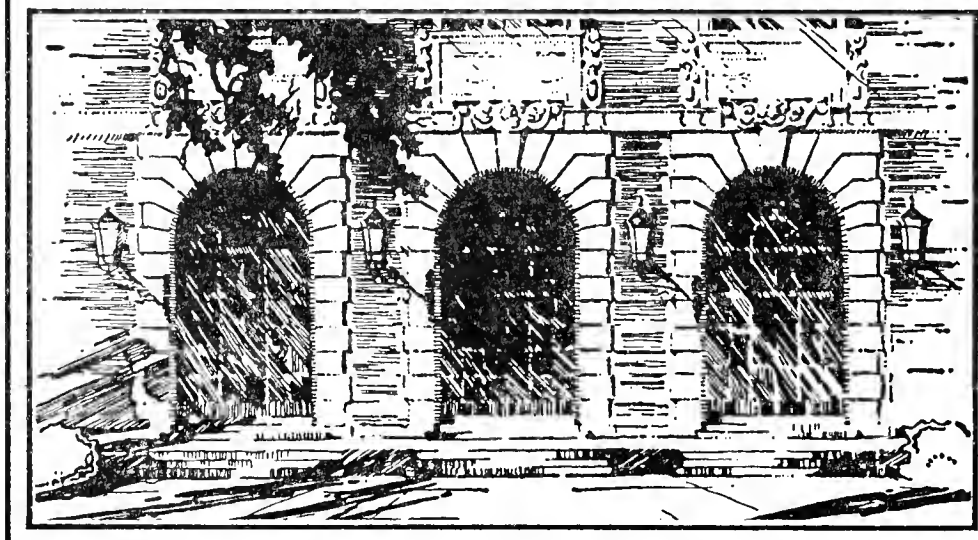
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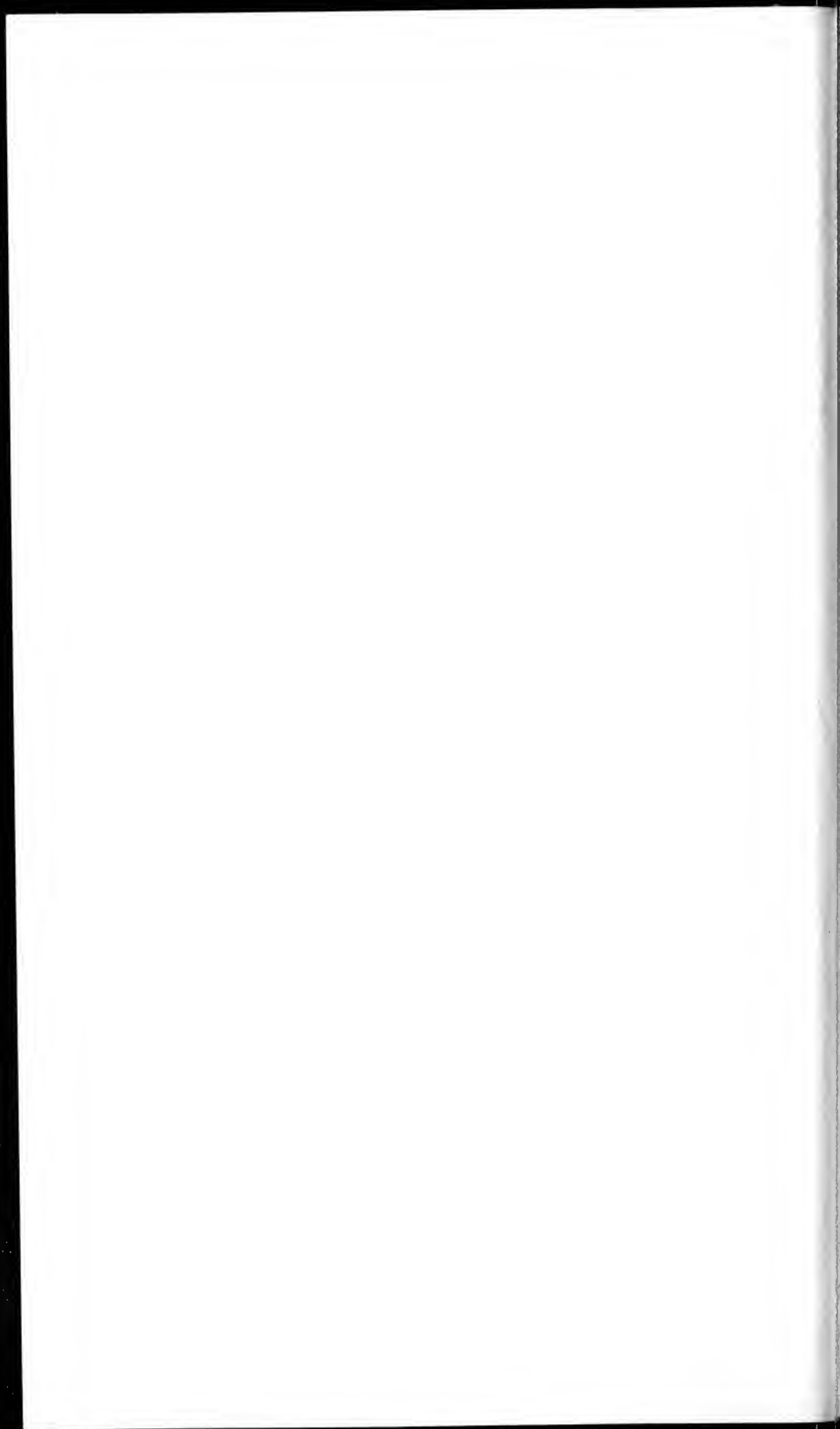
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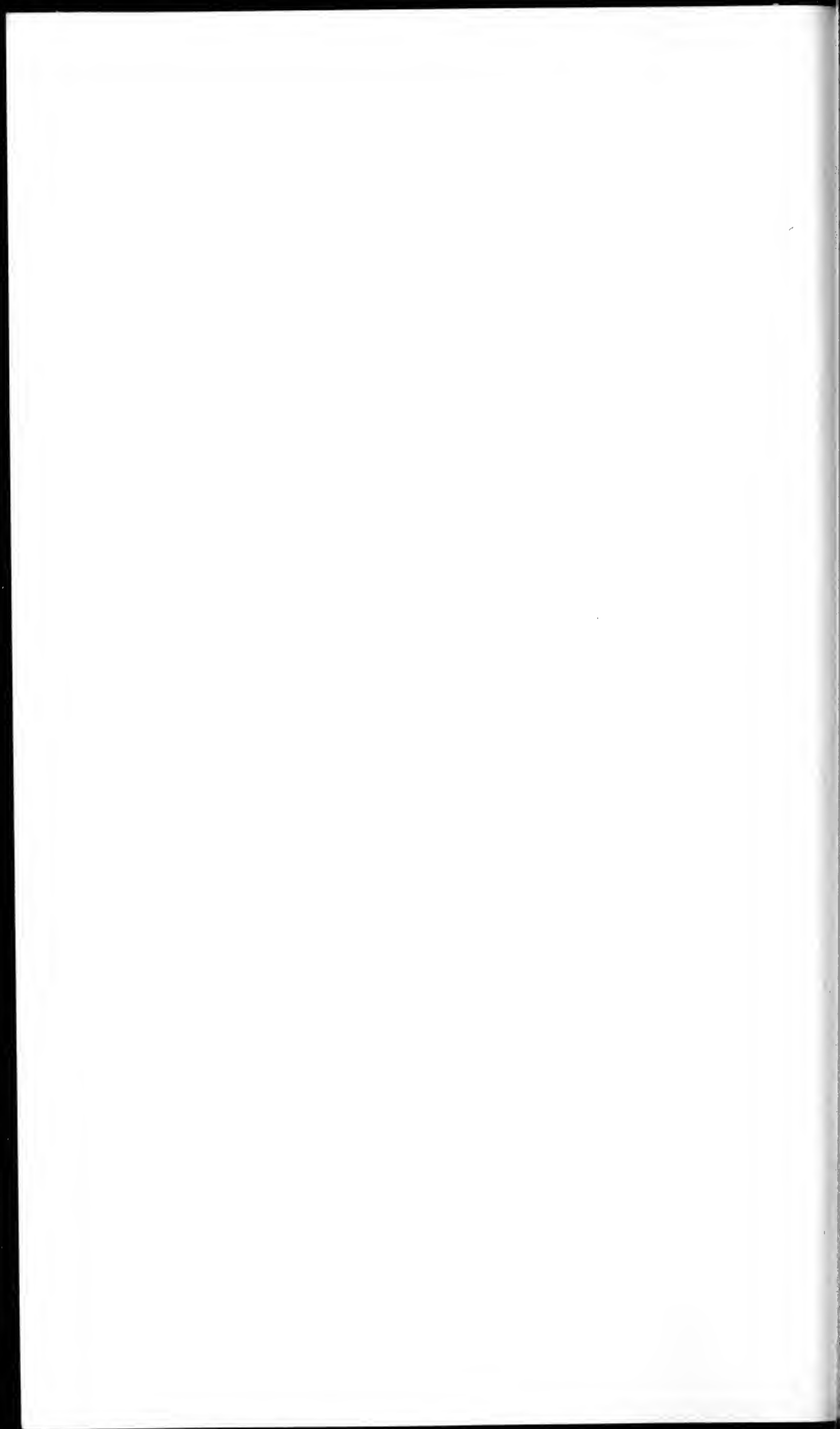
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THE AVICULTURAL MAGAZINE

BEING THE JOURNAL OF THE
AVICULTURAL SOCIETY

EDITED BY
PHYLLIS BARCLAY-SMITH, C.B.E.

ASSISTED BY
Dr. C. J. O. HARRISON

VOL. 78
JANUARY, 1972 to DECEMBER, 1972

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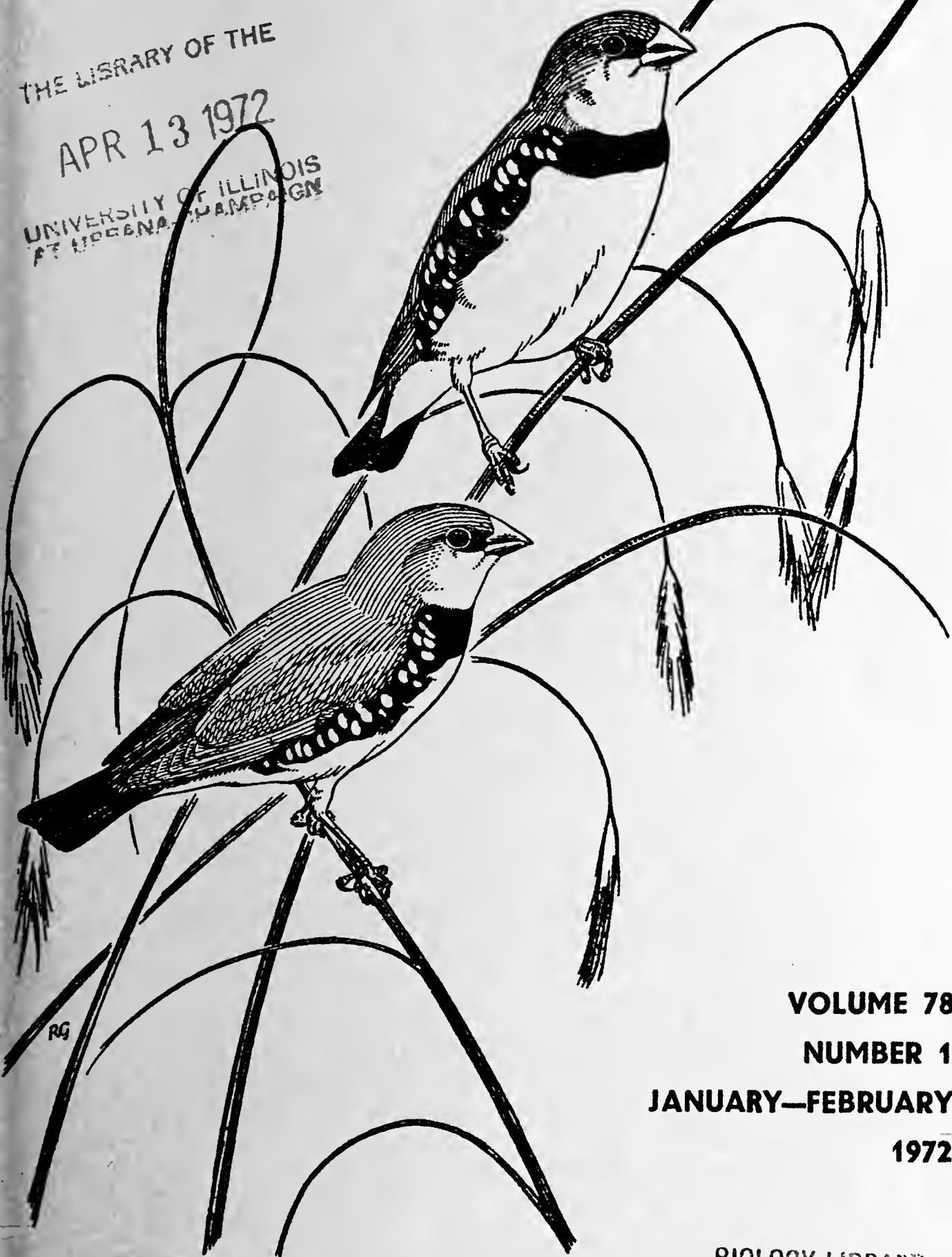
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AVICULTURAL MAGAZINE

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[Derek Washington

Breeding the Long-tailed Duck

The nest scrape was concealed under tall bamboos several feet from the base of a Silver Birch tree

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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JANUARY-FEBRUARY 1972

BREEDING THE LONG-TAILED DUCK

By DEREK WASHINGTON (East Grinstead, Sussex, England)

In 1971 Miss Betty Locker Lampson successfully reared two young from a pair of Long-tailed Duck *Clangula hyemalis* in her waterfowl collection at Copthorne, Sussex.

The parents were obtained as young birds from Mike Kitching in 1966. He had reared six that year from imported eggs. They were transported from his collection at Louth when they were ten weeks old. It was a very hot day, and the birds were carried in a cardboard box on a train crowded with holidaymakers from Skegness. However, they seemed unaffected by the journey and arrived safely in Sussex.

For two days they were kept in a pen at one corner of the lake. This was a fenced enclosure about 20 yards across, and included a small part of the lake. The duck appeared to be very fit and active, and so were released on the lake to join the rest of the collection, an act performed with some trepidation by their owner. She need not have worried though, for the birds have thrived ever since. The male in particular is an impressive bird. Not only does he have a series of striking plumages which change according to the time of year, but his lively nasal call is most dramatic. An observer with eyes closed might be excused for day-dreaming of far away places when hearing these notes together with the "hooing" of Eiders also in the collection. Both male and female have become quite tame and will swim within a yard or so for pieces of fish and other tit-bits.

For the majority of their life these have been the only Long-tails in the collection. In 1967 one male was raised from imported eggs (obtainable until 1969 at a cost of about £1.50 each). This bird died nearly two years later, but during this period no interaction was ever observed between it and the pair.

I first became acquainted with the collection in 1968, and to start with had some difficulty in distinguishing the one-year old male from the two-year female. In May however I noted that the female had a pale stripe above the eye, whereas on the younger male this was more of a pale patch. In August I noticed a variation of iris colour between the three birds, the younger male and the female both being a darker brown than the older male. Photographs taken in March 1969 show the older male in a plumage which he has attained each winter since. His head

was pure white except for sharply defined black cheek patches. He had some long pointed white feathers spread over the black of his back, and his long black tail was fully developed. The younger male differed in having a short tail, smudgy cheek patches and mottled brown and black back. The female was similar but more brown than black with smaller cheek patches and brown on top of the head as well.

During May 1968 the older male was seen chasing his female, often underwater. This male was quite vociferous at the time, but by early June his calls became less frequent. In the first few days of May 1969 the pair were seen mating, but nothing came of it. We thus had high hopes for the 1970 season. However, the drake became so pre-occupied with a lone female Red-breasted Merganser, *Mergus serrator*, that he completely ignored his own mate. To prevent this happening again the Merganser was removed from the lake before the 1971 season.

During 1971 some display was noticed, particularly in the first few days of June. Typically the male swims round the female with erect tail and neck, and bows the head whilst uttering his call. One day the pair were seen some way from the water, which was unusual. They appeared furtive after the manner of many breeding waterfowl in captivity (and possibly in the wild too). Two days later a scrape was discovered under some tall bamboos, several feet from the base of a silver birch tree. This was an extremely dry site, well drained, with plenty of dead bamboo leaves on the ground and a lot of cover overhead. The nest was slightly raised up on bamboo leaves.

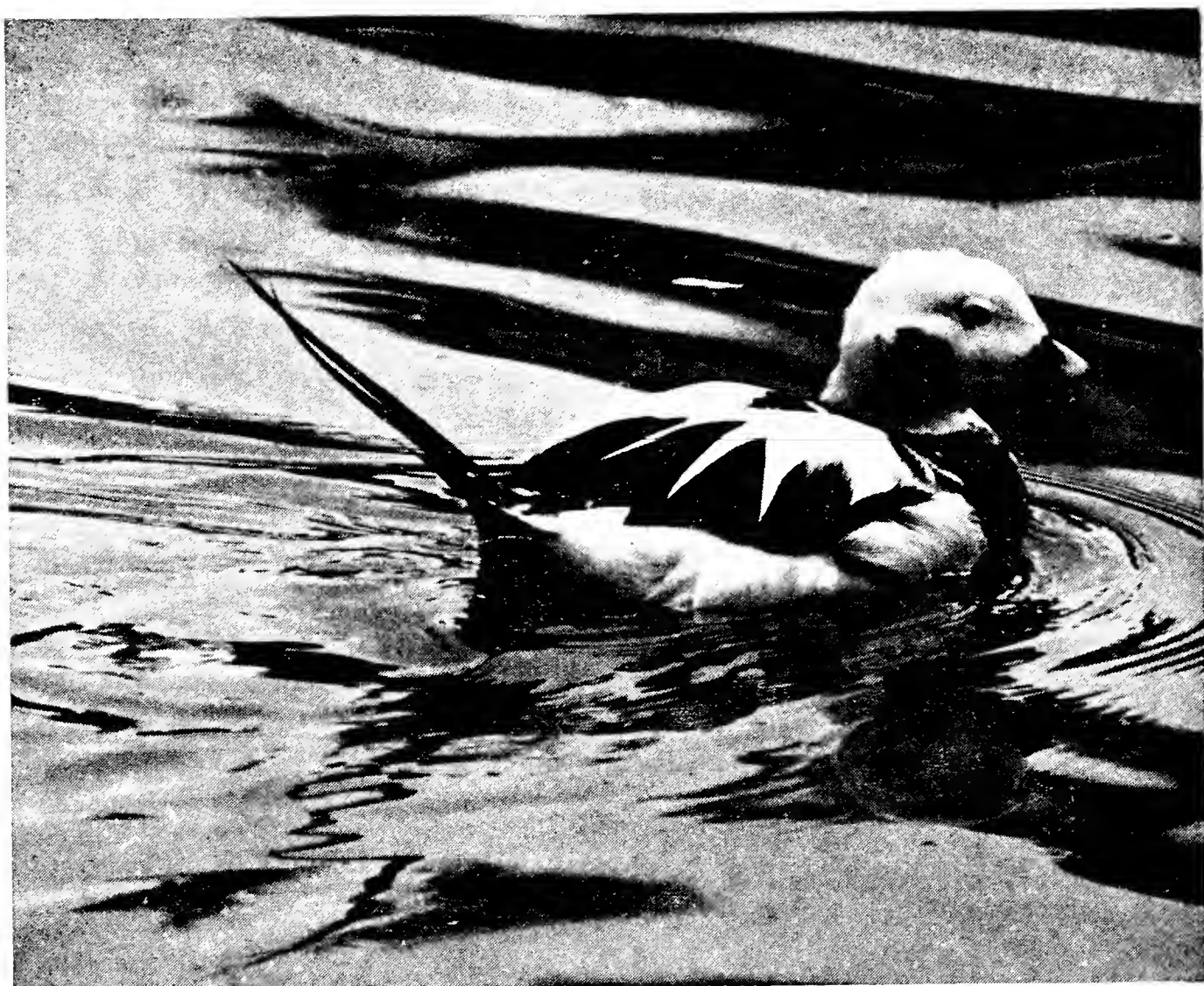
The site was visited only infrequently to avoid disturbing the birds. Nothing happened for two weeks, but on 24th June one egg was found in the scrape, well covered with bamboo leaves. Subsequent eggs were laid on 26th, 27th, 29th June and 1st July five in all. The duck then started to sit, lining the nest with down.

When the rest of the collection were fed, twice a day, the duck came off to feed leaving her eggs well covered with down and bamboo leaves. She always had a good bathe after the afternoon feed.

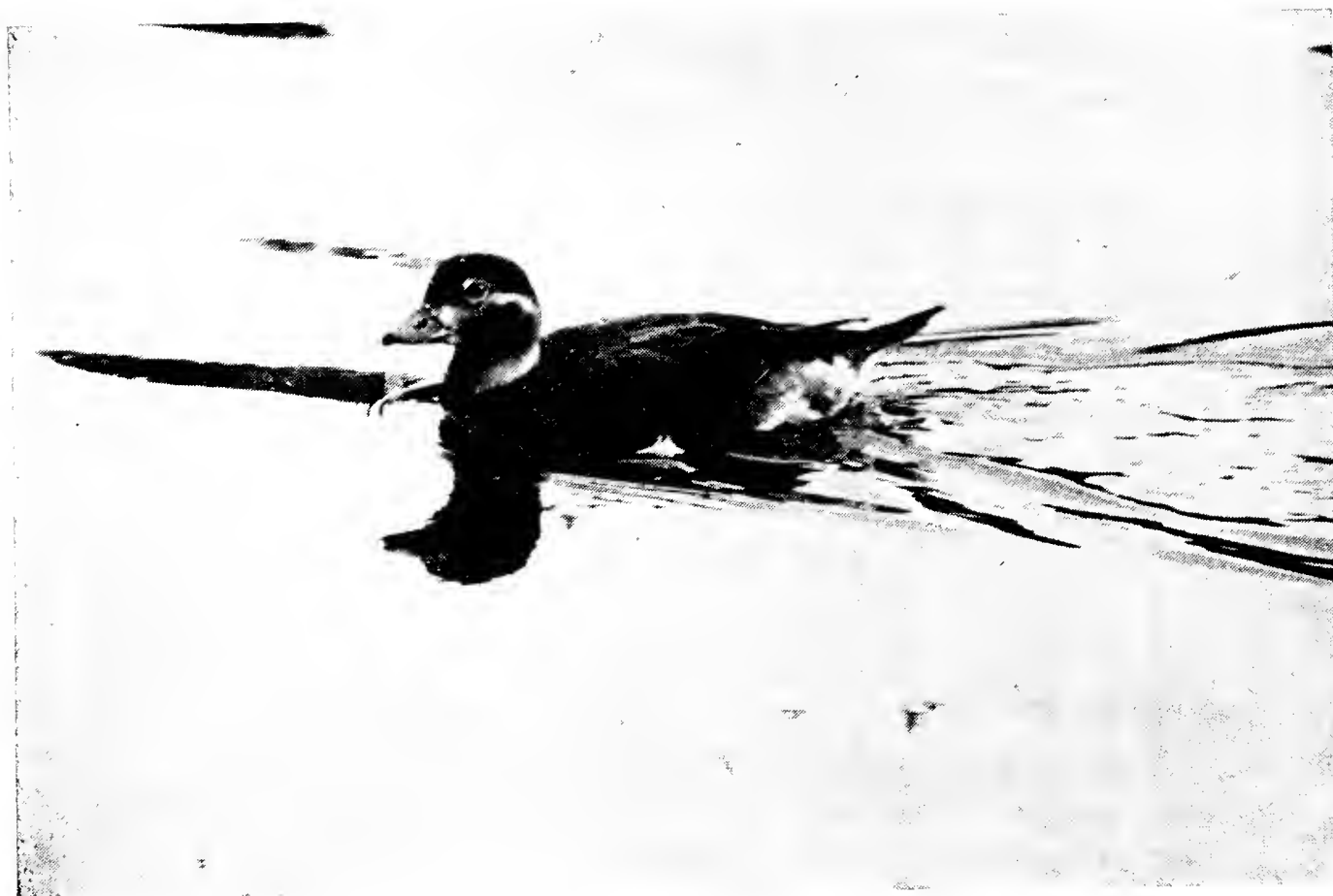
One egg was removed from the nest on 27th June and a second on 1st July. These were put under a broody bantam and the duck was left to incubate 3 eggs herself. She sat very well throughout. The drake appeared to take no interest after the first egg had been laid, and was hardly ever near her even when she came off to feed. During incubation the nest area was roped off to remind us and the occasional visitor to keep well clear. Previously we had frequently used a path close to the nest to reach the far corner of the lake.

The two eggs under the bantam hatched on 27th July. The nest was then examined and contained two bad eggs and one chipping. When the nest was examined again, next day, this egg was missing. It was subsequently found some distance away with the duckling dead inside. It had presumably been carried there by either a Grey Squirrel or

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Adult male Long-tailed Duck
October 1971



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[Derek Washington

The more advanced young male Long-tailed Duck swimming in the deep pool
October 1971

Moorhen, both of which were abundant (the latter especially have often been seen raiding nests and entering nest barrels). Other active predators were Jays, Magpies and Carrion Crows, but in our experience these seem to concentrate on more open sites. The duck had by then deserted the site and was on the lake, seeming very disconsolate.

After hatching, one of the two chicks was smaller than the other and has remained so ever since. They were transferred with the bantam from their sitting box to an enclosure in a concrete floored shed. The enclosure measured 7 ft. \times 5 ft. and was made from plastic netting on a light wooden framework. The concrete floor was painted with a green rubberised paint to present a soft washable surface. An open-fronted coop was placed in the enclosure so that the hen could come out if she chose. A 250 watt Philips infra-red lamp (a type with internal reflector and red glass) was suspended two feet above the floor in front of the coop. A foam plastic mat (from Woolworths) was put under the lamp, and a folded hessian sack laid on a board under the coop. The sack and the mat were changed daily.

A shallow pool with a sloping side was built into the floor of the enclosure, and fresh water was flowed through this daily. A flat tray also contained water, about $\frac{1}{2}$ in. deep. In this was floated duckweed. and numerous insect larvae, water fleas etc. gathered from local pools, this tray was also placed under the lamp.

The lamp was left running all day, but was turned off at night and the birds were shut in the coop. At about mid-day, when the sun was highest, the lamp was raised an inch or two until it was about 4 feet above the ground after two weeks. It was then turned off permanently.

No artificial food was given for 36 hours. Then a little hard boiled egg yolk and some Turkey starter crumbs were sprinkled on the mat and on to the backs of the ducklings. The food was always given dry, and anything uneaten was thrown away before the next feed. After the second day a few mealworms were pinched in half and thrown on to the mat and the shallow water dish. These proved very popular; once the chicks were a week or so old the mealworms were given whole.

The birds remained in this enclosure for three weeks. They were then transferred to an outdoor pen approximately 12 ft. \times 12 ft. in size. The wire-netting walls were rendered opaque at ground level by corrugated iron panels and the like. The floor of the pen was grass and it contained a coop for shelter. There was also a pool about 3 ft. across by 15 ins. deep and for a few hours daily by water pumped from a well. The incoming water was allowed to splash into the pool by feeding it to the top of some concrete slabs piled at one side so that some of them overhang the surface. This splashing seemed to stimulate the ducklings to bathe, thus encouraging waterproofing at an early age. There was also a grass covered hummock on which they liked to sit and several boards were laid on the ground as resting places.

The features considered important in rearing Long-tailed Duck to this stage are warmth, feeding and seclusion in that order. It is finally necessary to ensure the birds are waterproof before transferring them to a pond or lake. These birds (both males) remained in the outdoor pen together for 5 weeks, by this time the larger duckling had become completely waterproof. He was taken to a deep pool upstream of the main lake where he will remain all winter, whilst the other will remain in the outdoor pen until it too is waterproof. The birds were fed on growers pellets mixed with soaked puppy meal during this period. Chopped up Sprats were placed in a dish of water, and mealworms, duckweed and grit were also given.

Long-tailed Duck are among the most difficult of the sea duck to rear and great patience is needed with them. However the results can be very rewarding.

It is believed that this may be the first record of Long-tailed Duck reared anywhere from captive laid eggs.

* * *

BREEDING THE MOLUCCAN COCKATOO

(*Cacatua moluccensis*)

By NEIL O'CONNOR (Coulsdon, Surrey, England)

The original birds were purchased in February 1967, on the day they arrived in London from Hongkong. Both birds were very steady and although the cock did not welcome close approach he did not show signs of extreme resentment. The hen would readily accept tit-bits from my hand and I am of the opinion that she had been a pet bird prior to importation. She never seemed satisfied with her diet and always appeared to be searching for something which the seed mixture did not contain, and scattered the contents of the food pots with sideways flicks of her beak. She got very thin and, despite veterinary attention, died in June 1968. She was the only bird which was positively identifiable as a hen in the consignment of six which the dealer received.

The cock was put in an outside aviary in June and another bird purchased during the same month. Although freshly imported, it was enraged at being caged that it was transferred to the outside aviary two days after purchase. It immediately flew on to the perch and snuggled up to the cock; both birds quite clearly enjoyed each other's presence. The new arrival was truly a magnificent specimen possessed of a savannah splendour the like of which I have rarely seen. It also turned out to have a truly magnificent voice the like of which I have never heard. In April

1968 he—it was another cock—was transferred to a friend's aviary about five miles away, barely out of earshot.

Within a few days a replacement was found and this bird was quite obviously a hen. She had been caged in a pet shop for some months and was tame enough to offer her head for scratching. She was put outside with the cock in mid-May 1968. She immediately snuggled up to him and within seconds—when they were unaware of being observed—mutual preening session commenced. This hen likes to exercise her voice fairly frequently in the very early mornings and again in the evenings but usually its intensity and duration are tolerable. When the noise exceeds the allotted time it is put to an immediate stop by a device which is controlled from the house. The cock has never uttered a sound save when on a few occasions the hen put slightly too much beak pressure on one of his toes.

The aviary is 15 ft. × 5 ft. × 6 ft. high and is constructed of wood protected by metal strips. It is double-wired with 2 in. × 2 in. heavy gauge chain link on the inside and 1 in. × $\frac{1}{2}$ in. welded mesh on the outside. The latter is primarily intended to keep sparrows out. The floor is grass which is kept cut. The shelter is open-fronted and is 4 ft. long. This aviary is not one of a series of flights but stands on its own and the Moluccans cannot see the occupants of the other aviaries. Two food pots are used, one containing sunflower seed and the other a mixture of roughly 50% canary seed, the balance being made up in equal proportions of white millet, paddy rice, buckwheat, hemp, wheat, oats, cloats and maize. A few drops of Abidec multivitamin solution are put in the drinking water once weekly if remembered and spinach beet,andelion, apple and carrot are also provided. Cuttlefish bone is largely not wholly wasted; I have never known them to sample the contents of the grit pot and this has been removed—probably a mistake to do so.

A nest-box was provided in May 1968, soon after the acquisition of the hen. It was hung high in the shelter, under cover but in line with the edge. No interest was displayed in the box.

In mid-January 1969, the hen was seen crouching and edging up to the cock which merely made him move further along the perch until he reached the wire when he stepped over her back only to be edged back to the other side. Finally, he stepped on her back and made a half-hearted attempt at pairing, all the time looking coy and indignant at being inveigled into performing an act in the flight which in the interests of modesty and decorum should be performed in the privacy of the shelter. He was a good and persistent solicitor; his modesty and decorum have long since vanished. Later that month, the hen was seen in the nest-box, a visit which necessitated some fortification. More rotten wood was placed in the box in May, much of which was promptly ejected. Pairing was observed again in June and was frequently observed from

then on until October, always in the early morning. Much the same ritual was observed during 1970.

The dimensions of the nest-box are 20 in. \times 15 in. \times 10 in. with a 5 in. diameter hole the top of which is 7 in. from the top of the box. Although made to a specification suggested by a renowned aviculturist, I always considered the hole to be too low bearing in mind the overall dimensions of the box. Consequently, the box—which was taken down for the winter months—was reversed, a fresh hole being put nearer to the top and the original hole which was now in the back was blocked up. This afforded the birds a greater degree of privacy which was probably the main factor which induced them to go to nest. The box is covered both inside and outside with welded mesh; the edges and the entrance hole are protected with aluminium strips. It was re-hung in exactly the same position in March 1971.

Pairing was observed in April and both birds were spending a lot of time in the box. Sometimes the cock spent the whole day in the box and slept there at night also. Some rotten wood was ejected. By early May both birds were spending most of the day in the box; the cock usually roosted in the shelter at night having emerged from the box at or after dusk. The birds never left the box unattended—one always remained inside. This pattern continued throughout May; the birds were rarely seen and when one or the other emerged it was for a quick visit to the food tray. The hen was rather threatening if the aviary was approached during one of her short periods out of the box. I might add that whilst she was fairly tame when purchased, her tameness disappeared immediately on release in the aviary.

The sound of young was first heard on 8th June. Soaked sunflower and soaked oats were offered, neither was touched nor was hard-boiled egg. Peanuts were always fed sparingly or not at all but a fistful was now given each day and they disappeared rapidly. Plenty of carrot and spinach beet were given each day and these also disappeared rapidly. The birds continued to spend all day in the box. On 24th July a little maintenance became necessary in the aviary and the opportunity was taken to inspect the box. One chick was seen but as both adult birds were inside the chick was partly hidden. Earlier, on the same day, both adult birds were seen out of the box together for the first time since incubation commenced.

On 26th July both birds were out of the box at 6 p.m. and another inspection was made. Although within 4 ft. of me, they made no attempt to attack but showed slightly more displeasure than usual when I entered the aviary. Only one chick was in the box, also showing his displeasure by swaying gently from side to side with beak open. Still in the pin feather stage, the salmon colour of the crest was visible. The most striking thing about the young bird was its enormous legs and feet which seemed out of proportion to its body.

At about this time—late July—the hen recommenced to herald the dawn, something we all had missed since incubation commenced. Both birds were frequently seen in the flight together in the early mornings. On 7th and 11th August, the box was again inspected and this revealed a very well-grown chick which gave a very loud shout when I put my hand too close to it. Again, the parent birds made no attempt to attack.

On Sunday, 29th August, carrot fed earlier in the day was hardly touched at 5 p.m. Both birds were in the shelter and the box was again inspected. The chick was well developed and fat; it has a very fine crest and well-grown flights, the tail was very short—not more than $1\frac{1}{2}$ in.; it was dead, 82 days after we first knew of its arrival. It was removed from the box and—very surprisingly—both adult birds roosted in the box that night; the box was taken down on the following day.

Owing to the August Bank Holiday, it was not possible to despatch the chick for post-mortem until Tuesday and although the package was sent by express post to Wickham Laboratories it was not possible for them to reach a conclusion owing to the advanced state of decomposition. The birds were again observed pairing on 8th September; perhaps their efforts and mine will be more successful in 1972.

* * *

BREEDING THE MALABAR STARLING

(*Sturnus malabaricus*)

By W. SELWYN (Llandrindod Wells, Radnorshire, Wales)

I was interested to note in the current issue of the A.M. that Raymond Franklin had bred the Malabar Starling *Sturnus malabaricus*.

I would like to record that I bred one youngster in 1971. I purchased the cock bird at least ten years ago, and the hen not long afterwards. They went through that very hard winter of 1962/63, in an aviary with an outdoor flight 12 ft. × 6 ft. and with a heated indoor flight attached to which they could go when cold, together with a lot of other softbills that made up my collection. In August 1969, I moved to a house having plenty of ground and I built an aviary with the flight 25 ft. × 8 ft. × 7 ft. having a house attached 12 ft. × 8 ft. half of this being a wire flight. The house is heated by tubular heaters controlled by Thermostat kept at 45°–50° F.

The Malabars are housed with my rather large collection of Softbills consisting of cock Fairy Blue Bird, Pair of Pekin Robins, two pairs of Cisticolops, pair of Yellow-Winged Sugarbirds, Black-eared Golden Tanager, Superb Tanager, Cock Shama, Grey Backed Thrush, Orange leaved Ground Thrush, Black Headed Sibia, Pagoda Mynah, Red

Vented Bulbul, Rosy Pastor, Coppersmith Barbet, d'Arnaud's Barbet, and a Pair of Gold Fronted Fruit-suckers. As the above collection mainly consists of cock birds my interest in them is for their beauty in a garden Aviary, although I have bred for two years some Zosterops.

Last May I hollowed a log of poplar, the finished box being 16 ins. deep by about 7 ins. inside diameter with an entrance hole $2\frac{1}{2}$ ins. in size. This I hung up at the far end of the flight which is heavily planted. All the years that I have had the Malabars they have never shown any interest in one another, and I was always in doubt if I did have a true pair, although the one was of much brighter colour than the other, as was his vocal ability, he being a good mimic—imitating a cat, Jackdaw, and a lovely Wolf Whistle.

I did not observe any mating display or any nesting material being carried to the nest by either bird, but one day in early June I saw the hen come out of the log nest. This prompted me to unscrew the box off the framework of the flight and as the top was firmly nailed on I had to look inside with the aid of a small mirror. I could see two blue eggs in the bottom of the box. The nest consisted of green leaves, small twigs and grass, not much of a nest for a Starling. When these eggs were laid I have no idea and as my habit is to shut my birds in every night, both Summer and Winter, I cannot imagine how these two eggs ever hatched; for each evening as I went to the aviary she would go in with all the other birds and the eggs would be left uncovered each night.

Not ever seeing the cock bird take any interest in the hen or the nest box I thought the hen was just going through the motions of nesting and that the eggs could not be fertile. However one day in late June I saw the hen taking a beakful of mealworms into the box, so I had a look inside and saw one young one that would be about two days old. The next day I looked and there were two young. After this inspection I left them alone for two weeks. Then on looking again I could only see one large young one with eyes open and well feathered, and no sign of the other one.

The remaining young one grew well and left the nest on 27th July. After I found that there were young in the nest I would shut all the birds in at night including the hen then open the shutter a few inches and the hen would come out and go into the nest box and brood the young one for the night. The hen did all the feeding, the cock bird never once going near the nest box. The young bird left the nest in good weather and the hen still continued to feed him for quite a long while until he could feed himself. She reared him on mealworms, maggots, softfood and any insects that could be found in the aviary. I disposed of him in October last. I regret that I cannot give any dates or more details as to this breeding but it was carried out in such a haphazard manner.

BREEDING THE YELLOW-BREASTED BUNTING AT CHESTER ZOO

(*Emberiza aureola*)

By WILLIAM H. TIMMIS, Curator of Birds and Mammals

The Yellow-Breasted Bunting is a very strikingly coloured bird. In the adult male the forehead, ear-coverts, cheeks, surround of the eye and throat are black; the rest of the crown and entire upper parts are dark chestnut, with a narrow chestnut band across the breast, dividing the bright yellow crop from the yellow breast and underparts. The wings are dark brown with two broad white bands, and the whole of the lesser coverts and tips of the greater coverts are white. The tail is dark brown with a white wedge on the outermost feathers; this is noticeable only in flight.

The female is plain yellow above, without any band across the breast; white wing-bars are present, as in the male; the outer tail feathers show an amount of white during flight, the white wedge being concealed when the tail is closed. Unlike so many of the Buntings which are on the British list, the Yellow-Breasted has no white or yellow face stripes.

This interesting Bunting has a vast breeding range which extends from northern Finland, where I understand it is comparatively scarce, eastwards through Russia and Siberia to the Kirghiz Steppes, east through north-west Mongolia and on to northern Japan. It winters in south-eastern Asia, Burma, Assam, Nepal, Northern Thailand, the Malay States and China, extending on to Formosa. As a vagrant it has occurred in many European countries, reaching the Atlantic in France, Heligoland, Holland and the British Isles. Two sub-species are recognised, the Eastern or Ussuri White-Shouldered Bunting (*Emberiza aureola ornata*) being darker above and richer below.

Four pairs of Yellow-Breasted Buntings were purchased from a local dealer on the 5th July 1971 and after two weeks' acclimatisation were liberated in our large Tropical House. This house is 240 feet long, 100 feet wide and 40 feet high and it contains fountains, waterfalls and pools, and is very heavily planted with tropical vegetation. Plants include Banana and Palm Trees, Pineapples, Pomegranates, Lemons, a large collection of Hibiscus, over 200 varieties of Crotons, Clerodendrons, Bougainvilleas, Passifloras, Gardenias, tree ferns and tropical climbers in profusion.

About one week later I noticed that one pair had established a territory, the boundaries of which could be defined by the location of song perches. Boundaries were defended by aggressive behaviour which ranged from soft warning calls to furious attacks. Perches used for territorial advertising included *Colocasia antiquorum*, *Cyperus alternifolius* and *Xanthosoma volaceum*, all of which are around a large pool; also used

were a very tall *Dracaena lindenii* and a small *Dracaena kewensis*, both of these being some distance away.

The only conflict noted was on 3rd August when a male tried to settle in the occupied territory and after a great deal of aggression by both the male and female the intruder finally left, leaving the original pair in full possession. With other species that came into the area, such as Hummingbirds, Laughing Thrushes, Magpie Starlings and Yellow-shouldered Whydahs to name but a few, the Yellow-Breasted Bunting was not particularly aggressive in defence of its territory. Only when another bird came near to the nest did the pair show marked belligerence. The male, or the female, or both together, would rush the intruder and drive it away. There was a tendency for the male to advertise territory while the female attacked the trespasser. The male tended to be concerned with the entire territory while the female was concerned with the nest proper. In most territorial disputes, aggressive displays often were effective without physical contact. The territory was abandoned after the last fledgling had been safely hidden at a considerable distance from the nest.

The nest was built at ground level among a dense clump of *Asparagus spengerii* with clusters of leaves concealing it from above, although it could be seen from the side and below. It was very close to a large pool and a pathway used by visitors, and was little more than a scantily lined hollow. Materials used included dead grasses, a few small leaves with finer grasses and a little hair which had been collected in our Mountain Gorilla enclosure. Both male and female appeared to take part in nest building, and the male, from my observations, took the initiative and did most of the work for the first three days, then the female took over and completed the nest. The male accompanied her when she went after materials and upon returning he sat on his advertising perch while the hen worked below. It would seem that the male selects the site for the nest and that the female, after much exploring both alone and accompanied by the male, finally settles on the site originally selected by him.

On the 12th August one egg was observed in the nest. This was a broad oval shape with a great deal of gloss, greyish-green in colour, blotched and smeared with olive-brown, with some underlying light grey and some spots and short lines of deep brown or black. The egg measured 20.51×15.01 mm.

I was away from the zoo for about three days after the first egg had been laid and upon my return found four eggs in the nest and the male sitting. The following day a fifth egg appeared and for the next 13 days I only saw the female incubating. On two occasions the female used injury-feigns when she was disturbed, running off along the ground dragging both wings before flying up into the highest vegetation to watch the intruder.

Three eggs hatched after an incubation period of 13 days from the laying of the fifth egg. It is now generally agreed that the incubation period should be considered the time from the laying of the last egg to the hatching of the last young when all eggs in the clutch hatch. Both sexes brooded and fed the young, chiefly on insects which had to be collected by the keepers. These included beetles, caterpillars, moths, hover-flies, craneflies, maggots, small earth-worms and locust hoppers which are bred in the zoo, plus mealworms. From what I could observe, a small amount of regurgitated seed was fed. When feeding the young the pair, in turn, poked from one gaping throat to the other in a fast and regular rhythm. The nearer a chick was to a parent, the more feedings it received. Faecal sacs were eaten by both parents during the first few days but later were carried considerable distances and dropped.

The young left the nest after fifteen days and looked very much like the adult female, but paler feathered. The parents continued to feed the three young for about two weeks, after which they appeared to lose all interest. At this stage the young were able to feed themselves. At the time of writing, 7th November 1971, one of the chicks has vanished but the remaining two can be seen at the feeding bays early in the mornings and late afternoons.

As described above the Yellow-Breasted Bunting has been bred at Chester Zoo. It is believed this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

THE BREEDING OF JERDON'S STARLING

(*Sturnus burmanicus*)

By RAYMOND FRANKLIN (Chesham, Buckinghamshire, England)

Jerdon's Starlings range through central Burma. From Smythie in his "Birds of Burma" it is described as follows: "Length 10 in, head and breast dirty white, upper parts dark grey, underparts purplish. The plumage varies greatly with the seasons but the red tipped bill is usually noticeable. The Jerdon's Starling is a typical dry zone bird of scrub jungle country." I would say that my birds measure up to this description but the red tipped bill is absent.

I purchased a presumed pair of Jerdon's Starlings from a High Wycombe dealer in November, 1969. During the following winter they were housed in my birdroom with other Starlings, in a 12 ft. flight. At the end of March, 1970 they were put outside into a flight 15 ft. × 6 ft. × 6 ft. planted with bamboo etc.; with a small pond for bathing and drinking.

On the 24th April I hung a log nest box high up at one end of the flight, the log being a branch of black poplar rotten in the centre and leaving a hole about 4 in. in diameter.

About a fortnight later the cock bird was seen carrying green grass and dead leaves into the log. The hen did not seem to do any of the work—but occasionally peered into the log to see how things were progressing. The only display I ever saw was a peculiar bobbing of the head in the male and a spreading of the tail feathers for a few seconds followed by a gurgling sound whereat the hen would rush up to him and put her beak to his. On the 31st May as I had not seen the hen for a day or so I took a torch and looked into the log. On seeing two fine pale blue eggs I noted the date and waited for what I hoped would be a hatching. On the 21st June what appeared to be three smashed and partially eaten eggs were seen on the flight floor about 12 ft. from the log. I can only presume the cock bird had brought the eggs out. I cannot say if they were fertile.

The birds seemed to lose interest after that, so during the first week of July I took the old nest out of the log to see if they would start again. Within a few days they started to stuff the log with more grass and dead leaves again. They subsequently abandoned the effort; so that was the end of attempts at breeding for 1970. At no time was copulation observed.

To start the 1971 season—on the 3rd April I hung a larger hollow log of poplar in the flight. Not much interest seemed to be shown but on the 24th April I found two broken eggs in the flight. I suspect they must have been carried out by the cock as they were not broken very much. During the second week of May the hen was in the log for long periods from which I surmized that she must have eggs. I was wrong. She remained in the log on and off until the 8th June when I decided it was time to take a look, as I thought that by now there should be young. On turning out the mass of grass and feathers etc. there were no eggs, so what had been happening I do not know.

After this I thought perhaps a change of house might do the trick so I replaced the log with a large parakeet nest box 30 inches long by 9 in. × 9 in., hung up almost horizontally, but slightly tilted so that the nest end was a little lower than the entrance hole. The cock showed immediate interest by loud calls and repeatedly popping his head in and out of the hole. During the following fortnight he built what might be called a nest but it was really only an untidy mess consisting of green grass, a few feathers and a few dead leaves. I would imagine the green grass provides heat and humidity. This time I saw very little display by the cock, but the hen was in the box on and off during the day. On the 25th June I decided to take a look and I was pleased to find one pale blue egg of usual starling size. Incidentally I frequently enter my flights and my birds get used to me and do not panic unduly.

On the 12th July I heard faint squeaks from the box and the parents were agitatedly looking for extra food, so from then on I kept out of the light for fear of disturbing them. Extra food was supplied of course, the usual mealworms and maggots being supplemented with insects brought home from expeditions into the countryside with a large net. I consider live food absolutely essential for at no time did I see the parents feed any soft food at all to the young.

On the morning of the 31st July three young came out and flapped feebly around. They were duller editions of the parents but one feature noticed was that the inside of the mouth was a lemon yellow in colour against the black mouth of the parents, (presumably to attract the parents to feed them). Unfortunately, one died on the first day, and one appeared to have rickets and after a week or so I decided to kill it. With less to feed the remaining baby progressed well. After a fortnight I took the young bird away as the cock was becoming aggressive towards it. The young bird was beginning to feed itself so I decided it would be safe.

On the 16th August the cock was seen adding new material to the old nest. I looked in the box again and found two eggs on the 18th August. The weather was rather hot that week so I sprayed both the aviary and the nest box with the garden hose.

On the 29th August I again heard squeaking from the box so it was back again to supplying insects and extras. After three weeks of hot weather the young bird (it was only one this time) was just beginning to peep out of the hole and was continually being called to come out by the parents; but as it seemed very reluctant to put in an appearance and the old nest was becoming rather unwholesome I decided to take the baby out of the box on the 19th September. This time there was one baby and an addled egg. The baby perched well but was rather a weak flyer. This time the cock was rather aggressive and I considered moving him but decided against this as it might upset the sequence of feeding, etc. The hen was doing all the feeding now and I had to stand by the food dish until she had taken sufficient for her and the baby before allowing the cock to feed. He became extremely agitated at this. On the 8th October I removed the baby as it seemed to be feeding itself, and also because of the cock's bad temper.

I now have two fine young Jerdon's Starlings which are coming along quite nicely to date (mid-November 1971). To sum up, I think my main difficulty was, of course, supplying food, as I am at work all day; but at midday my wife would put a quantity of mealworms and maggots in the flight. I attribute this successful breeding to quite considerable amounts of live flies, caterpillars and similar creatures, which I was able to obtain with the use of a large entomologist's sweep net, and, of course, to the long warm days of this particular summer.

* * *

MY BIRDS IN 1971

By S. B. KENDALL (Chertsey, Surrey, England).

For some time I have restricted my small collection essentially to five species, Roseate (*Elophus roseicapillus*) and Citron-crested Cockatoos (*Cacatua citrinocristata*), Swainson's lorikeets (*Trichoglossus heamatodus moluccanus*) Dwarf Turtle doves (*Streptopelia tranquebarica*) and Swinhoe's pheasants (*Lophura swinhoei*), all of which have bred with fair success for a number of years.

Of the Roseates, the old pair hatched and reared four after the initial loss of a clutch of eggs, probably as the result of the intrusion of a grey squirrel. The hen of the second pair laid six or seven eggs at intervals in the shelter and showed no disposition to sit. Miraculously I was able to foster five unbroken eggs with other cockatoos but none appeared to be fertile.

Of three pairs of Citron-crests. One hatched and reared two young, a second (including a cock that first bred here in 1955) reared one (I believe there were originally two). The third pair comprised my foundation hen (she also first bred for me in 1955) and one of her sons (hatched in 1957). For the last two seasons she had laid but had been attacked by the cock and been separated without incubating. This year I was abroad at the critical time and she was found dead, probably murdered. I happened to have a home-bred hen of the Timor race of the Lesser Sulphur-crest (*Cacatua parvula*) so paired her in April with the young widower. They promptly went to nest and reared two beautiful young which seem indistinguishable from one of the Lesser Sulphur-crest races. They are bigger than the Timor, with long elegant sulphur yellow crests. After the young emerged all four remained in the breeding aviary in apparent amity until, due to the appearance of a predator in the garden, I had to shut them into the small shelter. On the third night the cock slew his second wife. The young were not of course self-supporting but to my relief and amazement the father proved a model parent and they continued to thrive.

Close confinement of a breeding pair of cockatoos can be dangerous (I lost a hen Leadbeater's one December after shutting the pair inside when cleaning the aviary) but it is certainly not always so and I regularly have some pairs in large cages during the winter.

The Swainson's lorikeets comprise two separated pairs, and a colony of six to ten birds, depending on disposals. The separated pairs breed regularly throughout the year. The colony has produced a few young. Whether the comparative lack of success is because more than one pair is present or whether there are other reasons I am not sure.

My Dwarf Turtledoves (a very delightful species) have become reduced in numbers and by 1970 I had only one hen about which I could feel

optimistic. Importation seems curiously erratic but in 1970 some arrived and were advertised as the Burmese race, which I understood to be darker and more richly coloured than the Indian which I believed it to be. I bought a pair and was interested to note that although the cock didn't seem very different from those in my stock the hen was quite dark (brown rather than grey). Twelve months and many rains later I am undecided whether I have a pale cock or an ancient hen. I could not have believed it was possible to be confused about the sexes in this species, the marked difference being one of its admirable characteristics. However the imported cock justified the transaction and by the end of next season (dare I say it?) my stock should be safe again.

I let the Swinhoe's pheasants incubate and rear on their own and they prove excellent parents. Since one is under no compulsion with this species to produce as many as possible, bantams can be excluded, as a consequence some of the diseases, particularly histomoniasis, which are common to chickens and pheasants, can be avoided.

This has been a successful year for me, the main reason being, I am sure, that I do limit the number of birds and in particular the number of species I keep. Self discipline in regard to new acquisitions can be very hard at times but even with the very limited number of birds I keep I can have more than enough to do.

* * *

NOTES ON SOME AFRICAN STARLINGS

By P. BROWN (The Bird Garden, Harewood, Leeds, England)

I was adding up the other day all the species of starling I have kept over the past few years and came to the very surprising total of 23 species in all. All these I have kept either here at the Harewood Bird Garden or whilst I was with W. R. Partridge at Evesham.

I thought perhaps readers might be interested in my briefly running through the African section of the list with a few comments on each. I will start with the one perhaps most aviculturalists are familiar with and this is the Spreo Starling, *Spreo superbus*. Coming from East Africa, a very friendly confiding bird in the wild, a habit it retains well in captivity. I have kept and bred this bird on a few occasions, most recently this year at Harewood. I started with a group of nine birds in the aviary, but over a period of eight or nine months several birds had to be removed from the aviary after each in turn was picked on and victimised by the others. When we arrived at five birds, we seemed to have reached the right level and all went well from then on. They have never interfered with four Green Winged Doves and a pair of Vermilion Cardinals in the same aviary, but a pair of Cedar Waxwings had to be removed within hours to save their lives. I have found that the Spreo, along with the

Wattled Starling, suffer from Gape Worms, far more than any other I have kept. For some reason, the answer of which I am not sure, I have never managed to produce more than one young from each nest of this species.

The Chestnut Bellied Starling, *Spreo pulcher*, was the very first of this family I ever dealt with. We had three of these which had two nest boxes. The nest boxes were permanently full of grass and leaves, etc., and there was much to-ing and fro-ing but no eggs were ever laid, I am not sure what eventually happened to these birds but we persevered for some years with them. The Chestnut Bellied is very much like the Spreo Starling except that it lacks white on the chest and vent and the head is brownish rather than black as in the Spreo, and if I remember correctly the glossiness and iridescence was not so pronounced as in the Spreo.

The Amethyst Starling, *Cinnyricinclus leucogaster*, one of my favourites is a Starling I have never been without for very long over recent years. Unlike most Starlings the cock and hen are so vastly different that people who do not know are amazed to discover them to be cock and hen of the same species. Basically the cock is a vivid iridescent gunmetal violet-blue on the head and all upper parts, whilst underneath it is pure white, the hen on the other hand is brown above and white with heavy streaking of brown on the chest, a very thrush-like bird. I consider these birds as being nearly impossible to breed (Mr. Cummings formerly of Keston will smile at this as he bred them some years ago), for although I have kept them for several years I have never even got them to look at a nest box. They seem perfectly content to feed and just sit around in their aviary. I have now imported some fresh birds and am starting all over again to try to breed them. The cocks, seen against the right light, never fail to draw admiring comments from our visitors.

The Magpie Starling, *Speculipistor bicolor* is a Starling which I think very few people will be familiar with. It has been rarely imported into this country. It has a very limited range in East Africa. Whilst with W. R. Partridge two pairs of them were imported and within a year of their arrival in this country we managed to breed three young in two nests, two in the first and one in the second, for what was I think a world first breeding in captivity. The male has a glossy black head, chest and back with creamy white underparts, whilst the female has a dark grey head and chest, the back being black and underparts creamy as in the male. The most distinctive feature of the Magpie Starling is its bright fiery-red eye.

Sharpe's Starling, *Pholia sharpii*, I cannot really tell much about. I have only very recently imported two pairs of this interesting little Starling from East Africa, and these are the first I have ever seen. I should doubt very much if they have often been imported before. Side by side with Amethyst Starlings one sees an immediate difference

character for whilst the Amethyst are shy and flighty, the Sharpe's has a very placid nature, never flying around in the agitated manner of many freshly imported birds. When I received them the first thing I noticed was the short broad beak, rather like a swallow's, this suggesting they are workers of flying insects or very frugivorous. They certainly can demolish a nice ripe pear. In size they are similar to Amethyst, quite a small Starling. The entire upper parts are black with a slight deep bluish iridescence whilst the under parts from the bill to vent are slightly buffish white. The sexes are identical in colour but two of my birds have a bright yellow iris, whilst the other two have dark eyes. Whether this difference is sexual or a sign of immaturity in the darker ones, we shall have to wait and see.

Fischer's Starling, *Spreo fischeri*. I came across these by accident as the dealer who imported them had no idea what they were and liked them even less. I must admit they are not a particularly exciting bird but I do consider them quite neat and attractive. Basically they are grey above and from the chest downwards pure white. The head is lighter grey than the wings and back. My birds remain fit and well but have shown no interest, as yet, in going to nest. They are a little larger than Soreo Starlings, being more elongated in shape.

Glossy Starlings. Africa is the home of a good many species of Glossy Starlings, and several are so very much alike that identification is a problem, not only in the field but also when the birds arrive in this country in captivity. Some years ago we received a pair of Glossy Starlings from East Africa and it was some time before they were eventually identified as certain as Lesser Blue-Eared Glossy Starlings, *Lamprocolius chloropterus*. They were quite immaculate when received and like all this family stayed in perfect condition with no effort but showed no interest in nesting. They were quite slight birds, much slimmer in build than the commonly imported Purple Glossy Starling, *L. purpureus*, being an overall iridescent green with definite blue cheeks and ears.

The only West African species of this group I have kept are the common Purple Glossy Starling which I persevered with for three years before giving them up. I had a group which always stayed together in the aviary but, although in superb condition, they displayed no interest at all in the boxes I provided.

The Wattled Starling, *Creatophora carunculata*, in many ways perhaps the most interesting Starling, is for over half the year one of the most colourless drab birds it is possible to imagine being an over all mouse grey with darker primaries, full stop! On delving a little deeper one finds that the male during the breeding season loses all his head feathers to expose bright yellow flesh and he develops an extraordinary black be or wattle from his chin which in an old bird may be over an inch long. The breeding habits of this bird are quite unlike any other African Starling in that they build a magpie-like nest of twigs, often in groups

which will fill the top of a tree. Locusts form the bulk of their diet and one of their habits is to follow locust swarms stopping to breed only when the locusts breed. It would be interesting to find out how the Wattled Starling fares now that the locusts are so much controlled by man. I succeeded in breeding and rearing one youngster this year (1971), having tried since 1963 with the same pair. (This must be some kind of a record).

The African Starling group holds for me some strange fascination and I have at the moment only scratched the surface. There is the gorgeous Royal Starling, the beautiful burnished Splendid Glossy Starling, a whole range of Red Winged Starlings, the unusual White-Crowned Starling, the slender long-tailed Ashy Starling of Tanzania or the delightful little Emerald Starling from West Africa and a good many more. None of these have I yet kept, all I would most certainly like to.

Apart from their beauty these birds have many points to recommend them to aviculturists. They are quite tough, being relatively easy to acclimatize and keep. Their food requirements present no difficulties and as far as I am concerned, perhaps most important of all, they are amongst the most breedable of all soft-billed birds.

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HYBRID MACAW FROM A MATING OF *ARA MACAO* AND *ARA CHLOROPTERA* AT NEWQUAY ZOO

By R. A. HARPER (for PETER LOWE, Curator, Newquay Zoo, Cornwall
England)

The parent birds represented in this breeding were two four year old Macaws; the cock being the Red and Yellow, *Ara macao*, the hen the Green Winged (or Red and Blue) Macaw, *A. chloroptera*.

The birds first became friendly at the pets corner at Newquay Zoo where several Macaws are kept with clipped wings and allowed to wander over a large area during the day, being taken indoors for the night. The cock is a completely tame specimen; the hen not tame enough to handle but used to human company.

During the late spring of this year (1971), the two birds were seen to be indulging in much mutual preening and feeding and were then presumed to be a pair; however no nest box was provided for them and the nearby trees offered nothing in the way of nest sites so it seemed unlikely that the pair could ever begin to breed.

After some weeks the birds discovered a cement cave at the rear of the run intended for rabbits and guinea pigs the entrance to which is at ground level. The Macaws soon ousted the rodents from this cave and

From then on this became their headquarters. A layer of peat was placed on the floor of the cave and in this the birds dug a shallow nest scrape. Surrounding the run is a fence and on the top rail of this the two Macaws spent much time, mating was observed on this rail several times.

An egg was laid on the 30th May and a second on the 3rd June. On 7th June the eggs were inspected and it was found that both were fertile, one had a chick dead in the shell, the other was hatching but the chick died shortly after emerging.

The pair were seen mating on the 29th June and the hen went to nest again three weeks later this time laying three eggs all of which hatched at day intervals on the 14th, 15th and 16th of August.

One of the chicks was found dead and mutilated after two days, the other two appeared to be prospering and being fed by the parents. It soon became obvious however that one chick was rapidly outgrowing the other and two weeks after hatching the smaller of the remaining two chicks was found dead from causes which seemed to denote starvation. The remaining chick continued to prosper and whilst unfeathered it was constantly under the protection of the parents; once the chick was feathered however the parents spent long hours away from the nest. It is interesting to note in passing that both parents spent the night in the cave although there are no perches and the cock must have slept on the floor beside the brooding hen.

After one hundred and three days the young Macaw left the nest and climbed onto the rail for the first time.

During the incubation period the adult Macaws were very aggressive towards human intruders and in particular towards people that they knew such as their keeper; the nest was inspected at infrequent intervals, for the most part the birds were left to their own devices and undisturbed.

The Macaws at Newquay receive a wide variety of foods including an assortment of fruit, nuts, sponge cake soaked in honey, minced raw meat and a seed mixture containing sunflower, peanuts, canary seed and millet. During the period that the breeding pair were feeding young they consumed large quantities of the honey soaked sponge cake and also took more meat than normal.

In nearly every detail the young bird resembles its father the Red and Yellow, it has however the body colour of the Red and Blue being a rather dark crimson; it also has the tail colour of the Red and Blue and the lines of small feathers crossing the bare face patch. The yellow on the wing coverts is perhaps a little greener than in those carried by most Red and Yellows. Without the comparison of the parents one would take the young Macaw for a Red and Yellow apart from the face lines. The bird is the same size as its parents but of course has the grey eye of a young bird. The plumage is excellent with no signs of 'stress' in any of the flight feathers or in the tail.

On the third day out of the nest a sudden fright caused the young Macaw to use its wings and with surprising ease it flew in wide circles around the Zoo calling to its parents who screamed in encouragement. Like most Parrots it did not take kindly to flying down, preferring to alight on the tops of aviaries and trees.

At one stage when flying some distance from the Zoo the bird was joined by a flock of Herring Gulls who seemed half inclined to mob it followed by a most amusing encounter when a passing Raven changed course to fly alongside the Macaw doubtless wondering what on earth this bird could be!!

Fortunately the young Macaw was eventually captured and returned to its parents.

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BREEDING GREY WAGTAILS, *MOTACILLA CINEREA*, USING FISH AS FOOD

By R. MCCLUSKEY (Bedford, England)

This year, 1971, I have bred Grey Wagtails, *Motacilla cinerea*, with small fish as the staple diet. They were in a series of interconnecting aviaries around a bird-room, the aviaries being 6 feet wide and varying through 11 6 ft. ins., 7 ft. 6 ins., 5 ft., and 3 ft. 3 ins. in length. They shared these aviaries with a pair each of Pied Wagtails *Motacilla alba*, Chaffinches *Fringilla coelebs*, Greenfinches *Carduelis chloris*, Reed Buntings *Emberiza schoeniclus*, Blackbirds *Turdus merula*, and Redwing *Turdus musicus*. Instead of shutting the birds in particular aviaries I gave them the run of all during the winter and allowed them to choose the one they wished to breed in, on the grounds that I could always shut them off in it later if necessary.

The aviary which the wagtails chose was the largest. It had in it a small pond 2 ft. x 1 ft. and 4 ins. deep, which was fed with a constant drip of fresh water from a series of six galvanised trays situated one to each aviary, connected up with polythene tubing and gravity fed from one to the next. It also had at one end of the aviary a small cotswold stone wall almost hidden by nettles and tall grass in which the wagtails nested. A hollow log was hung near the top of the aviary in a further corner from the nettle bed, with an elderberry bush occupying another.

The birds were fed on my own mixture of softfood, together with maggots, mealworms and a few stick insects. Haith's "Robin Red" colour food was added to the softfood, and fed to maggots and mealworms. This preserved the yellow on wagtails but tended to give this an orange tint. I found in the past that my softbills have lost colour if they are not given colour food in their diet.

In March I began to experiment by giving the birds small fish taken from the local river which flows at the foot of my garden. As far as

now these were mostly minnows, but a few sticklebacks were also caught and also, I think, the fry of some larger fish. They were all about minnow size.

The Grey Wagtails were feeding on the fish. Both had black bibs and I thought I had two males but the one with the less black bib turned out to be a female. I never knew they were nesting until I saw the female with a bill full of fish disappear into a clump of nettles. On checking I found a nest made of grass, rootlets, moss and horsehair, containing four chicks about three days old and also one clear egg. The nest was situated at the small stone wall, almost hidden by nettles and tall grass.

The young were close-ringed at approximately eight days old; and left the nest on 18th June. I never at any time saw the parents feed the young on anything except minnows, although there was always a supply of maggots and softfood available. My nightly walks along the river bank armed with a two foot diameter net and bucket were not enough; with the Grey Wagtails emptying the large dish of water that I put in, containing not only minnows but water boatmen, dragonfly nymphs and a host of other aquatic insects that I couldn't identify. I also had to go fishing early in the morning before work, then again at lunch time, and so make two journeys in the evening. During my fishing expeditions I fell into the river on several occasions, much to the amusement and disgust of my wife and family, my wife saying that it was about time we oldie men grew up!

By now all the other birds sharing the aviaries were eating fish also. The Reed Buntings nesting in the hollow log in the same aviary and reared two young, while the Greenfinches reared three young in a nest in the elderberry bush. Apart from occasional bill-snapping between the Red and Grey Wagtails there was no trouble between the various species. On the first day of leaving the nest all four young wagtails ran about the aviary floor. The next day the largest of the youngsters was seen to fly a distance of three feet onto a branch of the elderberry bush. That night all the youngsters roosted in the lower branches of the elderberry. After this they roosted higher up on perches scattered around the aviary. They were all flying well at about 15 days old.

They continued to flourish and at 17 days old I first noticed one of them picking and taking fish out of the bowl. The others were not seen taking fish for themselves for another week and in the meantime they were all being fed, but by the male only. I had hoped that the female might have gone down to nest again, but she never did. Maybe it's just as well, I was having my work cut out looking after the one nest as it was. My next problem was persuading them to eat other food as they would only eat fresh small fish etc. and my only solution was to catch them up and put them into a large stock cage. On examining them I found that the only defect was that one had a back claw missing. I slowly weaned them from fish to maggots, mealworms, an occasional moth, and softfood. It was

quite a job as they did not look too happy whenever their allocation of minnows were gone.

All my birds still get minnows nearly every day, although not as many as they would like. The species eating minnows in my aviaries are as follows—Blackbird, Song Thrush, Yellow, Grey and Pied Wagtails, Greater Spotted Woodpecker, Chaffinch, Greenfinch, Whinchat, Rock Pipit, Crossbill, Yellowhammer, and Reed Bunting. This year I have successfully bred four Grey Wagtails, three Greenfinches, two Reed Buntings but had numerous failures; I have had clear eggs from Blackbirds, Chaffinches and Greenfinches; while my Pied Wagtails, Yellow Wagtail and Rock Pipits only played about.

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BIRD FARM—1971 BREEDING SEASON AT LECKFORD

By TERRY JONES (Leckford, Hampshire, England)

In 1971 at Leckford we had the misfortune to get a family of stoats into the main waterfowl enclosure. This was particularly serious as the whole place is enclosed in half-inch wire-netting topped by a rat guard. The first animal we caught was the old female who might have known where she got in, but it took us about two months to catch the entire family—eight in all—in that time they had of course killed a number of birds, but though we poisoned all the corpses we found we only killed some rats which were not the culprits; stoats unfortunately prefer the meat warm.

We had pairs of White-winged Wood Duck and Hartlaub and bred the latter. Literature on these species generally describe their social life as similar to the Muscovies.

In our experience the Hartlaub are very definitely monogamous with a very strong bond between the pair. In behaviour they are similar to the African Black Duck, *Anas sparsa*, they like cover, and are very intolerant of their own species when breeding. The female here would have killed a second female I tried to introduce if her mate had shown any hesitation. Here the duck has always nested on the ground, generally in rank sedge and grass, once in a box on the ground placed by a little side stream amongst rank plants. The incubation is 30 days.

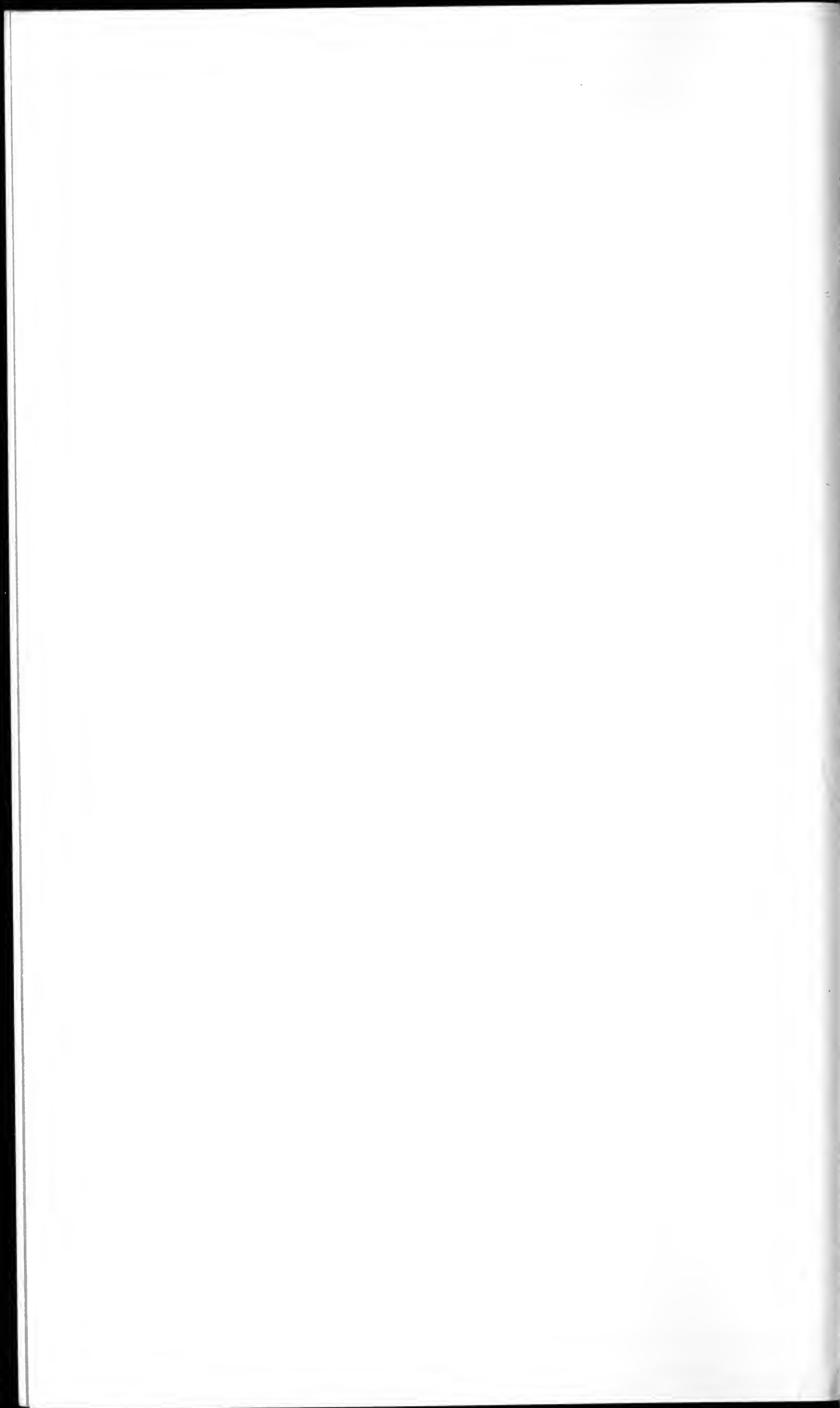
The White-winged Wood Duck we had only for one season. The pair were very tame almost feeding from the hand when one filled the dishes in the morning, and, at the same time, secretive. They spent a lot of time resting under a low bridge which takes a road over the enclosure, but were active as soon as evening started. They called a lot to each other, the female's voice is very similar to the buzzing voice of the male New Zealand Shelduck and the male's a weak falsetto edition.



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Hartlaub Ducklings

Terry Jones



ers. They mated regularly and after mating displayed noisily to each other throwing out their chests rather as do displaying Ruddy-headed geese and showing off their pale blue-grey and white shoulders and wing patches. They shared a pen with a pair of Radjah Shelduck and a trio of Hottentot which they ignored.

As I was very intrigued to find out how close to the Muscovies they really are I acquired a female domestic Muscovy, a black bird with a black neck. They utterly ignored her though the poor Muscovy when flying constantly solicited the male's attention.

There were four boxes in the enclosure, a Mandarin-size box for the Radjahs, a super-size Mandarin-type box for the White-wings, a large ground box and a little one for the Hottentots. The Muscovy demonstrated the fact that the "hole is greater than the part", and by some extraordinary feat laid two clutches in the Mandarin box, the Hottentots went up the ladder to the huge box and nested in one corner inside, the White-wings took over the big ground box and made a scrape. The drake often went to the box rather as do the male Mandarin or the Ring Teal when their mates are house hunting. Actually the males of most waterfowl do not choose the nest site except perhaps for the Muscovies and Comb ducks.

We reared about 30 Black Swans from three pairs, our birds always rear two broods, one in the Spring and one in the Autumn, only about one Black-neck as one of the females developed a throat infection in the Spring and did not breed. We reared six Coscorobas—the most lightful friendly youngsters and a good number of Ruddy-headed, Ruddy-headed, Abyssinian, Ross, Cackling and Lesser White-fronted geese. Red-Breasted were a disaster; 27 eggs from three females with only two fertile, one egg in each clutch from the same goose, the two younglings are both males.

We have a trio of African Pochard from which we have reared a few annually. But in October 1970 they started laying and laid clutch after clutch right through the winter including 14 at Christmas time. We did not set any of their eggs until February, finally we let the ducks sit in to stop them. We reared over 70, when the ducklings started gathering their parents turned on them and the ducks started laying again in September. To stop them we caught them up and put them in a holding pen with a lot of young birds and at last they have given up. We reared broods of all the Shelduck, about 60 Ring Teal, 36 Puna and most other more usual species.

Homosexual behaviour is common in waterfowl, particularly amongst the brown Shelduck even when the sexes are about equal, young males, often seem attracted to each other and get "paired" before the young females are interested in anyone. If this catches the eye of any field naturalist in South Africa or Australia, I should be very interested to know whether it occurs in the wild.

We have never had this happen amongst young European Shelducks but in 1969 we kept back five pairs of young New Guinea Radjahs for future stock, the five males were brothers and the five females sisters so from our point of view, it did not matter how they paired, or we thought it did not! As they do not breed until two years old, we left them all plus a spare duck together in a large pen, four of the drakes paired homosexually and when put in their breeding pens simply stood on tip toe and yelled to their boy-friends in other pens. The net result was that only one of these young pairs bred. After a bit of moving friends to opposite ends of our establishment we have now got everyone properly paired and hope to breed Radjahs in 1972 as freely as we bred African Pochard in 1971! As a commercially run concern we do try to estimate the sort of numbers of each species we rear each year; we try, but the birds have the final say.

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THE 1971 SEASON AT CLÈRES

By JEAN DELACOUR (Clères, France)

It was an unusually dry and sunny summer in North-western France which was favourable for bird raising. The spring, however, had a succession of warm and cold spells which caused a lot of clear eggs and even a few species did not nest at all. As usual, there were some very good, as well as disappointing results. We had 27 young Emus from two pairs, but only a few, late-hatched Rheas. Our Cassowaries now adult, fight savagely and had to be separated. Surprisingly no cranes laid, nor did our old Screamers, but we now have two newly imported pairs. Two pairs of Trumpeter Swans, now four and three years old have not yet shown any sign of breeding condition. One pair of Black-necked Swans reared early five and later four young, while two other pairs produced infertile eggs only.

A pair of Nénés first laid early in March, and two young were reared under a bantam; the parents later reared four more. There were also Emperors and a few Giant Canadas, Cackling, Barnacle Blue and Snow Chinese, Lesser White-fronted Geese, but no nests of Ross's or Red-breasted were found. Our Black Brants were unsuccessful. We kept the last three years offspring, over twenty birds, and they proved much less colonial in their nesting habits than we expected; they fought bitterly, three birds being killed, and even the parent pair failed to breed. They will have to be separated or moved into the larger park. There were also five Ashy-headed and 10 Cereopsis as well as a number of Paradise and South African Shelducks and six Moluccan Radjahs. The old female Australian Radjah, over twenty-five years old, died after laying two clutches of clear eggs; we now possess only one pair of that subspecies probably the last one in captivity.

We had been very successful last year with maned Geese, but in 1971, only one clutch of five was found and the young reared. There were many young ducks, the best being Puna, Sharp-winged and Ringed Teal. Australian White-eyes are very prolific; a number of them are reared on the lake and remain well full-winged.

Game-bird breeding was made difficult by the rebuilding of a twenty-partments pheasantry. A number of Peafowl, including 6 Green, Pheasant-Pheasants, Junglefowl and others could however be raised. The Brush-Turkeys in the park produced no young, as they usually do. Various doves, including Wongas and Lemon Doves also bred well, as well as some Parrakeets. Quakers are now well established free in the park. A Kookaburra was hand-reared from the egg, and among Passerine birds, a Black-throated Tanager *Rhamphocelus nigrogularis* was reared, which Dr. P. Ciarpaglini will report in some detail.

The collection of Hornbills, Toucans, Touracos, Humming birds, lorikeets and of delicate perching birds has been maintained at a good level and losses have been slight both outdoors and indoors and there are more birds in the park and the various enclosures than ever before. Therefore we anticipate greater success next season. But always the unforeseen happens with living creatures and aviculturists must look forward to the future with a good dose of philosophy.

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REPORT ON THE TROPICAL BIRD GARDENS AT RODE, 1971

By DONALD RISDON (Rode, Somerset, England)

PARROTS

The old pair of Blue and Yellow macaws again produced two young birds making fifteen in seven years. For the first time a pair of Red and Yellows have bred two nice youngsters. The parent cock is an oldish bird which we received as an adult some seven years ago. He had previously been kept as a pet. The parent hen is one we imported five years ago as a young bird.

We now have twenty-five macaws of which twenty are liberty fliers. Sometimes as many as twelve birds can be seen in the air at once. It is, however, always possible to release them all together. Certain pairs show dominance and will attempt to drive off other pairs which they can't get on with.

The young unmated birds (mainly home-bred Blue and Yellows) make the best spectacle as they fly often in flocks of four to six together. Adults fly always in pairs.

They seem to have little true homing instinct. If they stray more than a mile away they are lost and have to be fetched back. On one occasion two years ago, five Blue and Yellows disappeared one afternoon. To my surprise, these included the old breeding pair which had three young in the nest. They did not return and that night we had to bring the three babies indoors and keep them warm with a hot water bottle as they had not started to grow their feathers. All five birds were retrieved next day but they had split up and were widely scattered round the district.

This sudden dispersal is hard to explain unless they had been scared away by the appearance of some bird of prey. They dislike the silhouette of a heron and, strangely, those of seagulls. Small hawks, like Kestrels and Sparrow Hawks, don't seem to worry them. They are fairly easy to recapture as they are trained to fly to the rattle of the food tin and quickly come down when hungry.

Only once have we actually lost any for good. That was a pair of Red and Blues which took to feeding off the country. It was a particularly fruitful Autumn with plenty of beechmast and berries about, and they refused to come back to their aviary at feeding time. They stayed about the grounds for several weeks and eventually disappeared. Normally such conspicuous birds are quickly seen and reported to us.

Leadbeater's Cockatoos bred two nice young ones, as did the Roseate

The Umbrellas hatched a young one but let it die when quite young.

Derbyans reared two young which is about their usual quota. In some years they have raised three. This year, for some extraordinary reason after they had fledged, the old cock and one of the young ones quite suddenly bit off their wing and tail feathers, rendering themselves flightless. The old hen, who can be a bit of a shrew at times, was suspected of bullying them, so was removed to an adjoining aviary, but it will take a moult before they can fly again.

All this happened within a day or so. The more I see of parrots the more I become convinced that featherplucking (or biting) has nothing to do with diet but is a form of nervous frustration.

We have had a pair of Eclectus for many years. The hen is imprinted on human beings and will not allow the cock to mate with her. Consequently, her eggs are always infertile. Every year after his moult the cock remains in perfect feather for about six months. Then in a matter of days he strips off all the outer edges of his breast feathers leaving a grey underfluff.

If one stops at their aviary to pass the time of day, the hen invariably comes up to talk. The cock's fury then knows no bounds. He loses his temper and lunges at the hen as well as the human visitor. He is obviously a very frustrated parrot and bites his feathers like a chicken biting its nails.

We have a Moluccan Cockatoo which has been with us for nine years. It is a feather biter rather than plucker and chews off the ends of

feathers including the primaries and secondaries. What is worse, it does this to other cockatoos under the pretence of mutual preening until the other is reduced to the same dilapidated condition. Yet we have five other Moluccans all in perfect feather receiving exactly the same diet and treatment.

It has not been a particularly good breeding year for parrakeets. Five pairs of Ringnecks produced seven young (two pairs didn't breed at all). Last year the same five pairs produced fifteen young ones. Six pairs of Rosellas produced only fourteen young between them, (eighteen in 1970). Three pairs of Stanleys raised four, (in 1970 there were twelve). Crimson-rings had four clear eggs. Pennant's did nothing.

Our colony of Peach faced Lovebirds have bred better than ever before, having reared sixteen young to fledging with young still in the nest at the time of writing (November). The species is generally reckoned not to be a good colony breeder but this group numbering seventeen individuals has been built up over the years from six originals without adding outsiders. Maybe this is the reason why they don't fight.

WATERFOWL

The four Red-breasted Geese purchased several years ago have all turned out males. Females seem to be at a premium.

We kept last year's three young Bar-headed Geese full-winged merely feather clipping them for their first year. Now they have moulted out and are flying well. We have tried full-winged Barnacles without success. Ours is not the best goose country. Too many tall trees, especially around the ponds, makes it difficult for geese to land—not so, however, for the perching ducks, especially Mandarins and Carolinas.

We now have a large flock of these mostly full-winged. Carolinas are much better stayers than Mandarins, which have gradually dwindled over a period of years and need constantly replenishing with handreared birds.

Competition between the species may have a bearing on this. We started with a preponderance of Mandarins but as the Carolinas have increased in numbers so have the Mandarins decreased. We put up large numbers of barrels in the trees for them but these are nearly always occupied by Carolinas. In fact our problem is to distinguish between their eggs. Mandarin eggs tend to be larger so we only set the larger ones but it is surprising how many produce Carolina ducklings.

Nevertheless it is a great joy to see and hear them in the spring arching like pigeons in the trees as they look for nesting sites.

There is a little pond in front of the bungalow where we live and every evening I "seed" it with wheat to attract the ducks near the house. At breakfast time it is quite common to count as many as ten or a dozen Carolinas and Mandarins on the water displaying to one another.

This summer a Carolina duck brought up a brood of eight ducklings

on this little pond. Normally the ducks try to take their broods down to the big pool but they have to run the gauntlet of storks, pelicans and wild herons, not to mention magpies and crows, so they seldom survive. This time, however, the duck had the good sense to bring her family on to the little pond and we hastily put a low wire fence right round it so that they were confined to a safe area.

PHEASANTS

Twelve nice young Peacock-Pheasants (*bicalcaratum*,) were reared. We must have bred and sold over sixty of these during the past seven or eight years, mainly from the original pair. I wonder where they have all gone because I hardly ever hear of any and do not know of any breeding reports.

Apart from the Peacock-Pheasants and Himalayan Monals, we don't go in for rarities here, preferring the commoner species which cannot be surpassed in beauty. After much trial and error we have found Golden, Reeves's and Blue Crossoptilons to be the best stayers at liberty, and reasonably compatible. All these are gregarious except in the spring when some do stray. But for the rest of the year they provide a feast of grace and colour which are a never-ending source of delight.

Just now in the Autumn they look at their best. The Golden in particular perform a ritual display in which up to a dozen cocks take part, running round each other in circles.

When this is performed in the half shade of the woods with sunlight dappling through the branches the effect of brilliance is quite bewitching. This display seems to have nothing to do with mating as hens are, more often than not, absent.

Although so closely related to Amherst's it is curious how the two species differ in temperament.

The Golden is a sociable bird and, except in the spring when cocks are establishing territories, they seldom fight seriously. Amhersts on the contrary are solitary by nature and aggressive at all times. We have tried keeping the two species at liberty together without success. Each Amherst cock demands several acres of territory and woe betide trespassers.

We have one beautiful specimen on free range at present. It is astonishing how he covers the ground giving the impression of being in two places at once. Many is the time I have been convinced that there is more than one bird around. The Amherst's display is no social affair like that of the Golden, but an aggressive warning to keep off.

Considering that Reeves's are about the best fliers among the ornamental pheasants, they are excellent stayers. They are also not as aggressive either among themselves or towards other species as is generally stated. On the contrary they will quite deliberately break up fights among other pheasants, shouldering their way in between the combatants, for all the world like policemen stopping a street fight.

This was particularly noticeable when we kept Silver Pheasants which were always picking quarrels with the peafowl.

We don't keep Silvers any more because they were such murderers when at liberty. They were very handsome but a party of them would systematically hunt other pheasants through the woods till they either drove them away or, if they dared to square up to them, dug a spur into their heads.

I then thought of trying Swinhoe's in their place. Here again the difference in character between two closely related species is remarkable. The Silver is gregarious and moves around in a loose flock. The Swinhoe's is solitary. The Silver is as tame and confiding as a domestic chicken. The Swinhoe's remains wild and shy. Unfortunately the species has the same bloodthirsty habits.

Blue Crossoptilons get a bit barbery in the spring but generally mind their own business. They are good liberty birds as they hardly ever fly and seem to prefer the vicinity of houses.

OTHER BIRDS

Our little colony of Cape Penguins continues to be self-supporting. We started with eight birds in April 1962 and now (November 1971) there are thirteen. During this time four adult birds (presumably of the original consignment) have died. Since they were adults when imported, their age was unknown. Nevertheless it is gratifying to be able to report an overall population increase.

The Sacred Ibis produced three young ones in 1971 making a total of four birds bred here during the past few years. In 1970 we handreared one young one and left him free as an experiment. He has stayed so well that we released two more of last year's young. Now they make a thrilling sight gliding above the trees.

The Scarlet Ibis which did so well two years ago have failed to repeat their success. Eggs were laid in 1970 and some chicks hatched but they were not reared. This year they laid but did not hatch. The brilliance of their colouring varies at different times of the year. They are at their best during the winter and spring. Then as their beaks turn dark and their breeding "wattles" develop the colouring on the head and neck fades to pink. At the end of the summer when moulting is imminent, their plumage fades all over to pink.

The Eagle-Owls did not attempt to breed this year for the first time since they became adult and started to lay. They have reared chicks in the past.

We have a Lydth's Jay which must be qualifying for the old-age pension. He has had a series of illustrious owners before coming here, including Peter Paris, the late Reg. Partridge and, before that, Sidney Carter. Two years ago he had a difficult moult. He began to breathe badly and I thought it was "curtains" but the old bird rallied and seemed

to shake off his complaint. He now looks as fit as a fiddle, and shares an aviary with a Hyacinthine Jay.

We have had four Occipital Blue Pies for a long time. They have nested more than once in the past and have even hatched young, yet surprisingly, in spite of this, have always remained a compatible group. This year one pair hatched and reared four fine young. All went well till fledging time approached when the parents set about one of the others. This was hastily removed. A close watch was kept on the third bird as we expected this to be attacked but we were not quite certain which was which of the pair. Then to my amazement I saw all three birds attend the nest with food one after the other.

The four young duly fledged and grew into fine birds. Then tragedy struck and two went down with gape worms. The remaining two started coughing but after prolonged treatment with first nilverm and then Thiabendazole seem to be improving.

Our pair of African Casqued Hornbills raised our hopes for a time by plastering up the entrance hole cut in the side of a barrel. As the summer waned, however, they lost interest. Perhaps we shall have better luck next year. These Hornbills are extremely hardy. They scorn their shelter summer and winter and always roost outside.

We have a fairly representative collection of Touracos—White-cheeked, Pink-crested, Hartlaub's and Purple-crested. The White-cheeked are the hardiest and seem the most inclined to breed. One pair have nested regularly for some years. Usually they fail to sit properly but domestic pigeons will hatch their eggs perfectly. The incubation period is the same as that of pigeons (18 days) but the problem is how to rear the young from such an early age. A fact which never seems to be mentioned in literature on the subject is that the young gape like young blackbirds. Also their eyes open within twenty-four hours of hatching and they are quite active in the nest, so obviously pigeons couldn't cope. We have tried handrearing but so far without success.

Two years ago the old pair of White-cheeked did rear two youngsters but neither survived to the first moult.

Two single wattled Cassowaries which were purchased two years ago as half grown youngsters are now nearing maturity. Although they look different—one being considerably more heavily built than the other, they are not compatible and we have never been able to run them together for any length of time. One or the other eventually panics and runs full tilt into the fence surrounding the enclosure.

They make ferocious woofing noises more like dogs than birds. They have a spectacular threat display fluffing up their black hairy plumage so they look twice their normal size, inflating their necks to show the red orange patches of skin, and stamping their feet.

For the first time in many years our Purple-Headed Glossy Starling failed to rear any young. We have quite a flock of home bred birds

is species but lack of room has prevented us from breeding to the next generation.

Softbills need plenty of space to breed. In a place of this kind which depends on public support for its maintenance, visitors expect to see more than one pair of birds in a large aviary which otherwise looks empty. Consequently, the birds have to share the accommodation with other species. The resultant competition for nesting sites and live food means that breeding successes are more by luck than judgement. Nevertheless it is surprising what can be achieved with careful management.

Of one thing I am certain; admission of the public does *not* inhibit the birds from breeding. On the contrary it steadies them down till they become indifferent to the presence of visitors, always provided of course that people keep to their side of the wire-netting.

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INFORMATION REQUIRED REGARDING FIRST BREEDINGS

By C. J. O. HARRISON, Assistant Editor

The publication of first accounts of breedings, or details of breedings rarely achieved, has always been an important function of the magazine. Such accounts should not only announce an achievement, but give full details of how it was achieved. Contributors usually do their best, but often omit some of the more obvious information. We have listed below the information which we would like to find in such contributions, and hope that by publishing this we will obviate the need to ask for further detail, and avoid delay in publication. We think contributions should include:-

The common and scientific name of the bird, the region where it normally occurs, and enough information about its appearance to enable the reader unfamiliar with the bird to visualise what is being discussed.

Any information on earlier housing, including arrangements for overwintering.

A description of the enclosure in which the birds are kept, giving details of size; internal facilities such as perches and plants, shelter, and temperature control if any; and other birds sharing the same accommodation.

The food normally given to the birds, and any seasonal variation.

The nest site and nesting behaviour of the birds.

Any information on laying, hatching and fledging, with actual dates where possible.

Food given to the young, and any special feeding behaviour, while young are in the nest, and when fledged.

Appearance of the young, and any clue to sex determination in the earlier stages and plumages.

Interaction between adults and young at different stages; and any changes of behaviour towards other birds occupying the same enclosure by adults or young.

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NOTES OF 1971 FROM THE ZOOLOGICAL SOCIETY OF LONDON

A remodelled and refurnished aviary in the Bird House at Regent's Park has been completed with the addition of artificial earth banks and a pool. The aviary has been designed primarily for bee-eaters, and the first tenants, three Carmine Bee-eaters are now in residence.

The most important breeding events of 1971 have been the successful rearing of five Snowy Owls, another Spectacled Owl (probably only the third ever recorded in captivity), Black-footed and Humboldt's Penguins, a Palawan Peacock Pheasant and four Malayan Glossy Starlings. The number of species breeding in the Snowdon Aviary continues to increase and this year included the Bristle-crowned Starling of East Africa which has probably not been bred in captivity before. The pair of White-cheeked Turacos in the Snowdon Aviary have been remarkably prolific and have produced four young from three different broods in only 11 months. They built their nest some 10 ft. off the ground in a dead tree densely covered by a creeper. Both parents fed the young, mainly with regurgitated fruit, dates, raisins, apples, pears, bananas, etc. The first youngster was still being occasionally fed by the parents three months after hatching. The last two young, hatched in September, were about three weeks old when the tree in which their nest had been built fell during a storm. They were replaced in the nest, and the parents continued to feed them though by now the nest was close to the ground. It was decided finally to move, and hand-feed them.

There have been a number of species which have laid eggs but for various reasons (including regrettably vandalism) have not hatched them. Disappointments in this respect have included the Green-winged Macaw, Sarus Crane, Alpine Chough, Roulroul Partridge and Kookaburra. Fortunately, when collectable the eggs have not been wasted and have been used by Dr. Kennedy and Dr. Vevers for their research on shell pigments.

One of the saddest losses in 1971 has been the death of our male Ostrich at the age of seven years. It was particularly sad, not only because he was a great character and had survived a long illness in the previous year but also because his new young wife had produced her first eggs. Surprisingly the first egg was laid when she was only 18 months old, and perhaps

not surprisingly they were infertile. Now having established her sex she hopes to obtain another male for her. A death which was especially noted was the Steller's Sea Eagle. She died of old age having been in the collection since 1937. She was received in exchange from Moscow and was thought to be about two years old when she arrived in London, making her 36 years old when she died.

Species or sub-species new to the collection have included two Curlew-headed Helmet Shrikes, three Abyssinian Ground Thrushes, two White-bellied Blue Flycatchers, a Little Green Bee-eater, two Yellow-green Grosbeaks, a Yellow-streaked Lory, a Dusky Lory and the Congo Peafowl. This latter species and a pair of Imperial Pheasants were deposited with the Society by Antwerp Zoo, and we were particularly pleased and honoured to receive both these rare species. The Congo Peafowl was not discovered until 1936 and still little is known of its biology in the wild. The Imperial Pheasant from Central Vietnam is possibly even rarer and is likely to be on the verge of extinction. Those few in captivity all originate from one pair collected and described for the first time by Jean Delacour in 1924.

A small group of ostriches was purchased at the beginning of the year and later transferred to Whipsnade where they will join the White Rhinoceros herd. Also transferred to Whipsnade were five African hand-reared cultures of three species. They now inhabit a large new aviary with Little Egrets and Sacred Ibis.

P. J. OLNEY.

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NEWS AND VIEWS

Advertisements offering "Fabulous Sun Parrots" have recently appeared. These refer to *Aratinga solstitialis solstitialis* of which G. A. Smith has recently obtained a pair. He writes "Sun Conures are separated in their distribution from the Jendaya Conure by the width of the Amazon river estuary and by the tropical rain forest which lines the river's mouth and banks, for they are birds of the Savanna Country. All accounts of these extremely handsome birds suggest that no two are coloured exactly alike. They resemble the Jendaya Conure but the wings and back, which are green in the Jendaya, are bright yellow with the flight feathers blue. The gold of the body feathers is also overlaid with a flowing suffusion of an exquisite tangerine-red shade. My birds are confiding but not hand tame. They agree well with a pair of Jendayas with which they are housed. All four sleep in the same box at night but remain in their subspecific pairings throughout the day. Their voices can be distinguished by different themes on the same basic pleasantness"

News from the Tropical Bird Gardens, Rode. D. H. S. Risdon writes: "The following more notable breedings have taken place during 1971:— 12 Grey Peacock Pheasants, 3 Sacred Ibis (bringing our total flock to 10 birds), 4 Occipital Blue Pies, 2 Cape Penguins (bringing the total colony to 13 birds), 2 Leadbeater's Cockatoos, 2 Roseate Cockatoos, 2 Blue and Yellow Macaws, 2 Red and Yellow Macaws and 2 Derbyan Parrakeets. The Scarlet Ibis laid but failed to hatch this year. A wild heronry seems to be establishing itself in the trees surrounding the lake. Over the years young herons which have fallen from their nests prematurely and have been unable to fly have been brought to us. After teaching them to feed themselves it has been our practice to turn them loose down by the lake. By this time they have learnt where a living is easy and seldom go far. Moreover, they have obviously told their wild friends who now come in to share the pickings. This year we are pretty sure there was a nest in the top of one of the tall conifers bordering the lake. Now it is quite a common sight to see as many as six to eight herons sitting around at penguin feeding time, waiting for the sprats left over by the penguins. They also consume quantities of dead day-old chicks put out to feed the Storks and Secretary Birds. On a recent rough census we counted fifty Mandarin and Carolina Ducks on the lawn, most of which are full-winged. Carolinas predominate".

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Breeding results 1971. E. Williams has had a remarkably successful breeding season, the results reflecting the perfect conditions under which his stock is kept. His birds produced 30 Splendid, 5 Turquoise, 5 Elegant, 7 Bourke, 3 Bluewinged, 10 Redrumped, 5 Manycoloured, 7 Rosella and 3 Pennant's Parrakeets, 13 Cockatiels and 2 Abyssinian Lovebirds. P. Paris also did well and bred 6 King, 22 Splendid and 9 normal/yellow Turquoise Parrakeets as well as several Princess of Wales, Bluewings and Bourkes. Also bred in his aviaries were several series of different species including 4 White-bellied and 7 Black-throated Canaries and 4 of the East African race *Reichenowi*. Seven Nyass Crimson-winged Waxbills complete a very impressive list.

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Mr. and Mrs. K. M. Scamell, who are well known for the flair they have for keeping, breeding and exhibiting "difficult" species of tropical birds, are now well settled in their new home in Cornwall. Their move necessitated a drastic reduction in the number and variety of birds they keep but already 21 aviaries have been constructed, planted and screened with shrubs like *Escallonia* which grow so well in Cornwall. Among the many rare birds they have retained are four species of Manakins (Banded-tailed, Long-tailed, Blue-backed and Helmeted), Red-crowned Ant Tanagers, Short-tailed Ant Thrushes, Black-cheeked Gnat Eaters and

veral others. Many of their potential breeding pairs including Rothschild's Grackles, Tacazze Sunbirds, Festive Tanagers, Blue-roated and Orange-gorgeted Flycatchers, and Red-headed Tits attempted to breed but were put off by the move. The Scarlet Cock-of-the-Rocks which reared a chick to 3 weeks in 1970, nested and laid two eggs but broke them and went into a moult.

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Visitors to "Winged World", which was built and opened to the public only a few years ago by the Morecambe and Heysham Corporation, are invariably impressed by the variety and condition of the magnificent collection of softbills exhibited there. The successful breedings which have been achieved are also impressive and include the following: four-winged Plovers, Rothschild's Grackles, Greater Kiskadees, Red-bellied Hornbills, Roul-Roul Partridges, Bleeding-heart Pigeons, Blue-crowned Mot-mots, Brown-throated Barbets, Yellow-breasted Fruit-eaters, Fairy Bluebirds, Thailand Hoopoes, Green Wood Hoopoes and Little Bee-eaters.

* * *

Writing on the lifting of the ban on the importation of parrots our resident stated in the AVICULTURAL MAGAZINE, January-February 1967, "It is up to importer and exporter alike to do everything possible to ensure that birds are packed and transported under the best possible conditions. We must remember, should this ban ever be reimposed it is very unlikely that it would be on public health grounds, but almost certainly on humanitarian grounds." Now, four years later, parrots and other birds are being imported in such appalling conditions that it would not be surprising if an import ban were imposed on animal health, human health or humanitarian grounds. Most of us have a strange ambivalent attitude towards animal dealers and we do nothing to try and improve the conditions in the frankly disgusting trade in livestock. Veterinarian G. A. Smith writes, "I wonder just what proportion of freshly imported birds die before a month of their imprisoned existence is out? Annually I make a resolution never to buy a bird through a dealer and I wish I could keep this pledge. But I haven't the strength of will to resist buying a specially enticing bird. During the past three years I have bought seven parrots from dealers. They were sent by rail, four were ill on arrival and died within a few days, two lived for a fortnight and one Red-capped Parrot for ten weeks despite the fact that its air sacs were practically solid with *Cryptosporidiosis*. At the time of writing (November 1971) so many parrots from Singapore and South America are arriving with Newcastle disease, which kills the birds almost invariably, that I would strongly advise anyone thinking of buying a parrot from a dealer to avoid doing so unless certificates of vaccination against this disease are forthcoming.

J. R. H.

REVIEW

GRUNDRISS DER VOGELZUGSKUNDE. By E. Schüz *et al.*
 Berlin and Hamburg: Paul Parey 1971. 88 DM.

The title of this book, unless I and my German dictionary err, could be translated as "An outline of bird migration"; a very modest title for a masterly and absorbing book. Professor Schüz and his collaborators Dr. Peter Berthold, Dr. Eberhard Gwinner and Dr. Hans Oelke have not only given a comprehensive outline of the subject but have filled in most of the salient features with a wealth of interesting and (equally important) interestingly presented detail.

The headings of the main sections of the book are (my translation of attempts thereat): (A) Bird migration—a form of animal travel; (B) Basic ideas and methods of migration study; (C) Pictures of migration from different areas; (D) The migrations of some individual species; (E) Some aspects of the migration scene; (F) The migrations of some non-European birds; (G) Eruptive migrants; (H) The influence of weather; (J) The physiology of bird migration; (K) Orientation; (L) The origins and significance of bird migration; and (M) Citation of references.

I must own that migration is not a subject I have studied intensively. It is possible therefore that there may be a few "slips" as can usually be found even in the best of books by reviewers of sufficient knowledge and pernicketyness, but I doubt if there can be many such. The book is written throughout in a clear, readable and interesting manner. It is profusely illustrated with 142 pictures ranging from maps showing the migration routes and distributions of individual species (of which there are a great many) to copies of Ancient Egyptian portraits of bird-catching and crane-keeping. I found the sections on individual species of particular interest but I think few bird addicts will be able to read any chapter without stumbling on some intriguing or thought-provoking fact which they had either not known or had half-forgotten.

Exclusive of the index the book contains 375 pages. I heartily recommend it to all who are interested in birds and who can read German whether they are especially interested in migration *or not*. I hope that it will soon be translated into English.

D.G.

NOTES

CEBU OR GOLDEN-BACKED HANGING PARROT

In "Extinct, Vanishing and Hypothetical Parrots" (1970, 198-204) I said that the Cebu or Golden-backed Hanging Parrot *Loriculus philippensis chrysonotus* was gradually exterminated by the destruction of forests on Cebu, about 1906. In this I erred, but I erred in good company for I merely repeated the believed status given in the *Red Data Book*, vol. 2.

T. R. M. Brosset writes from Gothenburg drawing my attention to an article by L. Rand, "Late Records of the Cebu Golden-backed Hanging Parrakeet" *AVICULTURAL MAGAZINE*, 1959, 177-178). Walter Goodfellow returned from the East early in 1929: amongst the birds collected were twelve Golden-backed Hanging Parrots. From this it may be inferred that this subspecies existed in some numbers on Cebu until 1929, at least. One presented to the London Zoo in 1936 was still living at the end of 1943 (1943, 161).

Thomas Brosset has kindly sent me a photostat copy of part of Rand and Rabor, "Birds of the Philippine Islands" (*Fieldiana: Zoology*, vol. 35, no. 7) (1960). In the section dealing with the birds of Siquijor Island it is suggested it may be that the race *siquijorensis* became extinct with the dwindling of the forest. As there are no less than eleven recognized races it can be appreciated that it is a little difficult to decide which have become extinct, especially as the Filipinos often bring specimens, especially the Central Island *L. p. regulus*, and carry them from the mainland to island.

A. A. PRESTWICH.

BILL COLOUR IN GO-AWAY BIRDS; AND A ROOSTING
ASSOCIATION OF NEGRO FINCH AND PIGEON

Here in Kenya I am staying with Tim and Jane Barnley, who have several aviaries on their farm. Recently two things have come to my notice which I think of special interest.

Firstly, in their description of the White-bellied Go-away Birds, *Corythaixiodes cogaster*, in Volume 1 of "Birds of Eastern and North-eastern Africa", Mackworth-Praed and Grant state that the sexes are alike. Other books I have consulted mention no sex difference. However, on the slender evidence of two birds caught not too far from here, I think there may be a difference. In both instances one bird of the pair possessed a dark, virtually black bill and the other a greenish-yellow bill. Mackworth-Praed and Grant say that the bill is black, but in the same volume Roland Green's plate shows it yellow. I would be interested if anyone has the opportunity to check, to know if this is a sex difference. I hope to make further observations myself.

Secondly, Jane Barnley brought to my notice the fact that a solitary Grey-crowned Negro Finch, *Nigrita canicapilla*, in one of the aviaries roosts on the back of one of two Green Pigeons, *Treron australis*. The other birds in the aviary are a Golden-Rumped Tinker-Bird, *Pogoniulus bilineatus*, and a Blue-naped Housebird, *Colius macrourus*. This Negro Finch is a member of the waxbill family, about 5 in. long, grey and white above and black below and on the face. It feeds principally on fruit and insects.

More recently a second Negro Finch has joined the other after a settling period of a few days in a cage, and I was most interested to know how it would roost, and I managed to make observations on half-a-dozen occasions. I could not do so on its first night in the aviary, when I think it roosted alone on a branch, while the other roosted on the back of one of the pigeons, but during the following six days I was able to check on all but one night.

On the first of these occasions the pigeons roosted side by side, so that they were facing each other; and one Negro Finch slept sitting on the perch between them, while the other roosted on the back of the right-hand pigeon. On the four remaining nights on which I made observations the pigeons slept a little apart from each other; and on three occasions one Negro Finch roosted on the back of each pigeon,

but once both roosted on the back of the right-hand pigeon, this being the one that the single Negro Finch had usually used. Since making observations on roosting birds is difficult, and may frighten them, I have made no further checks.

KITALE, KENYA.

MALCOLM ELLIS.

CORRESPONDENCE

EXPANDED POLYSTYRENE AS A MATERIAL FOR CAVITY-NESTING BIRDS

Aviculturists have always found it difficult to provide a suitable material in which species that excavate their own nest holes can burrow. In the May and October numbers of the British Trust for Ornithology News, Colin Brown has described how he induced wild Willow Tits to breed by providing a nestbox filled with expanded polystyrene, and subsequently had Lesser Spotted Woodpeckers breeding in a similar suitably-placed nestbox. These were typical nestboxes, in the latter instance covered with bark, and each was filled with a block of polystyrene into which the birds excavated their normal nest-cavity. It occurred to me that this information might be of help and interest to aviculturists faced with similar problems in providing nest-sites.

22, ST. MARGARET'S CLOSE,
BERKHAMSTED, HERTS.

C. J. O. HARRISON.

NOTICES

FIRST BREEDING OF THE BLACK-HEADED CAIQUE.

The breeding of the Black-headed Caique, *Pionites melanocephala*, described by G. A. Smith in the November/December 1971 number of the Magazine (pp. 202-218,) appears to be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Honorary Secretary.

AVICULTURAL SOCIETY LIBRARY

The Council is pleased to announce that the formation of a joint Avicultural and Ornithological Reference Library has been made possible by an agreement with the Linnean Society. The arrangements are as follows:

The journals which the Avicultural Society receives from all over the world in exchange for the AVICULTURAL MAGAZINE, together with any books which it receives now or in the future, will be housed in the Linnean Society Library, Burlington House, Piccadilly, London W.1. All these works will bear our stamp and be catalogued as our property so that they may be recovered at any time. The Linnean Society will gather together all its own works on aviculture and ornithology (some 500 volumes) and place them with ours to make one joint collection. A complete list of which may be obtained on request from this office.

The Avicultural Society will pay the Linnean Society a fee of £40 per annum for an initial trial period of one year and thereafter to be reviewed regularly. In return, the Linnean Society will house and administer our library and allow our members to use the *whole* of the Linnean Society Library. The facilities offered will be for reference only, as it is too costly and difficult to run a lending scheme. If the demand made on their library staff by our members is greater than expected, they may seek new terms, if the demand is very slight then we may seek new terms.

Avicultural Society Members' admission to the Linnean Society Library will be strictly by Reader's Ticket only, to be issued by this office at a charge of £1 per year (to be reviewed after the trial period). Foreign Members visiting the country for a shorter period than three months will be issued with a temporary Reader's Ticket free of charge.

The Library will be open to Members from 10 a.m. to 5 p.m., Monday to Friday. In addition for an initial trial period, it will be open on the following Saturdays in 1972, from 10 a.m. to 1 p.m. and 2 p.m. to 5 p.m.: 5th February, 1st March, 1st April, 6th May, 3rd June, 1st July, 5th August, 2nd September, 1st October, 4th November, 2nd December. The Library will be closed on the Monday following each of these Saturdays. Saturday openings will become a permanent feature if the demand proves great enough.

Burlington House is on the north side of Piccadilly, halfway between Green Park and Piccadilly underground stations. As one enters Burlington House, the Linnean Society is on the left, under the arch.

The Linnean Society's Library is acknowledged to be one of the finest in the world and Council hopes that Avicultural Society members will welcome having access to it. It owns many old and rare books on botany as well as the branches of pure and applied zoology, and receives some 900 journals covering the whole world of biology including many of particular interest to aviculturists. The Linnean Society is keen to build up a really comprehensive set of general reference books for identification purposes as well as field guides, checklists, etc., and it is hoped that between us, our two Societies can make this a unique collection of avicultural and ornithological works. If any Members have suitable books which they could donate to the Avicultural Society, these will be most gratefully accepted for our new Library and the gift duly recorded.

Members' suggestions and enquiries regarding this scheme, as well as applications for Readers' Tickets, should be made to me. We hope that there will be many applicants for tickets—one or two visits to this unique library and building would more than justify the expenditure.

HON. SECRETARY.

OFFICIAL SET OF AVICULTURAL MAGAZINES

The Council would like to record its gratitude to Miss Phyllis Barclay-Smith and Mr. Terry Jones for very generously donating to the Society a collection of AVICULTURAL MAGAZINES which between them cover the years 1937 to the present. It is intended to use these to form the basis of an official set of AVICULTURAL MAGAZINES which the Society does not at present possess. As complete volumes are collected, they will be bound and placed with the rest of the Society's books and journals in the Linnean Society Library where they will be available for reference by Members as well as officials of the Society.

If any member can donate earlier issues of the Magazine for this purpose, these will be most gratefully accepted.

HON. SECRETARY.

The Editor does not accept responsibility for opinions expressed in articles, letters or correspondence.

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FOR SALE. "Avicultural Magazine" from 1956 to 1970. Twenty issues of "Foreign Bird League Magazine", fourteen issues of "Modern Game Breeding". A. Dupont, 25 Ermitage, 1300 Wavre - Belgium.

WANTED. One good copy of Praed & Grant's "Birds of Eastern and North Eastern Africa", Series 1, Vol. 1. Jean Delacour's "The Waterfowl of the World", Vols. 2, 3, and 4. NORSHORE PETS, Marengo, Ill. 60152, U.S.A.

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NEW MEMBERS

The two Candidates for membership in the November/December 1971 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

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COLLINSON, D. R. 14 Rickmansworth Road, Pinner, Middx., HA5 3TG. Proposed by Prof. J. R. Hodges.

DAVIES, Gareth John. Kates Cottage, Netherbury, Bridport, Dorset. Proposed by D. Risdon.

DELAPENHA, Pat. 8 Hargreaves Avenue, Mandeville, Jamaica, West Indies. Proposed by L. Hill.

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HALE, Miss Janet. 1375 Limit Avenue, Baltimore, Maryland 21239, U.S.A. Proposed by A. A. Prestwich.

HAWLEY, James. Rt. 1, Box 153, Glendale, Arizona 85301, U.S.A. Proposed by M. Ollson.

O'CONNOR, Marty. P.O. Box 3303, Chicago, Illinois, U.S.A. Proposed by E. Kjelland.

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 A. J. WRIGHT to 401 Salbany, Albany Grove, Durban, Natal, South Africa.

MEMBERS' LIST

Please note the following omissions from or corrections to the Members' List published on 1st November 1971.

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 F. S. HOGG, 187 (not 167) Newton Drive, Blackpool, Lancs.
 MR. & MRS. A. A. PRESTWICH are both Life Members.
 SERGIO QUERCELLINI, Piazza Ischia 2, 00141 (not 00142), Roma, Italy.

Please Note

If Members have not already done so, will they please check the published Members' List and notify the Hon. Secretary of any error in their addresses or descriptions so that it may be corrected.

SUBSCRIPTIONS FOR 1972 were due on 1st January 1972 and the Hon. Treasurer would be obliged if Members would pay as soon as possible, if they have not already done so. Rate £2.50p (\$7.00).

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The Council wishes to thank the following for their donations to the Colour Plate Fund.

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Will members please donate their surplus books on birds to the Society for the benefit of the Colour Plate Fund.

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MARCH—APRIL
1972

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THE AVICULTURAL SOCIETY

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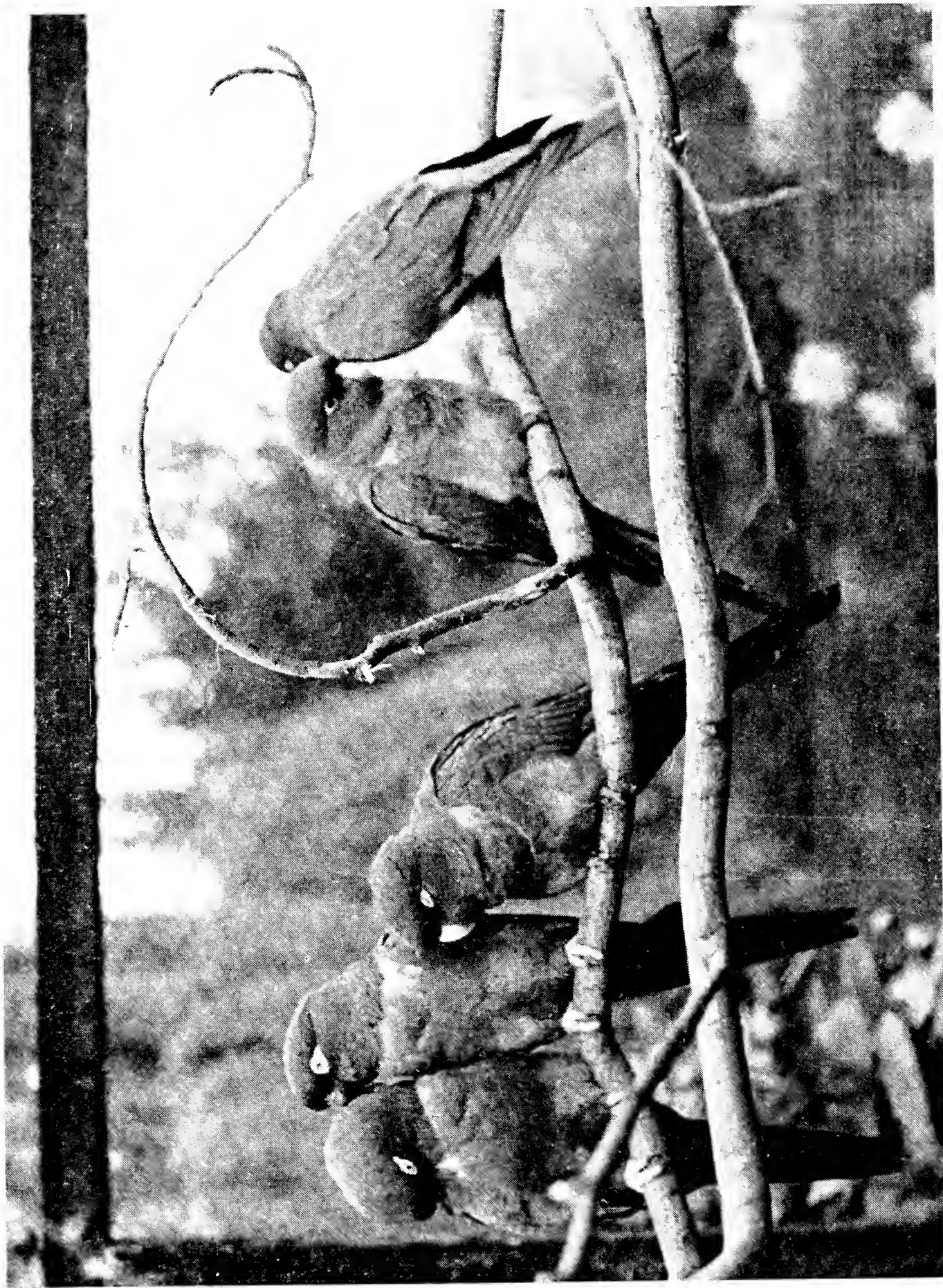
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AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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MARCH-APRIL 1972

BREEDING THE LESSER PATAGONIAN CONURE AT CHESTER ZOO

(*Cyanoliseus patagonus patagonus*)

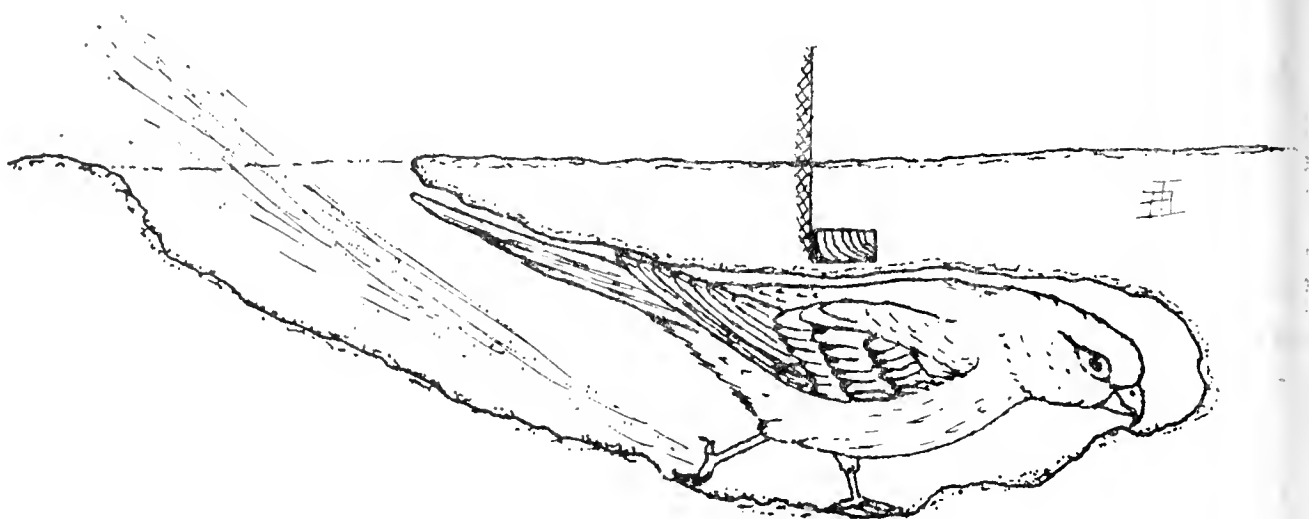
By WILLIAM H. TIMMIS (Curator of Birds and Mammals)

Conures have always been particular favourites of mine. They consist of seven genera: Aratinga, Nandayus, Leptosittaca, Pyrrhura, Cyanoliseus, Conuropsis and one aberrant American genus, Rhynchopsitta, and include many species and subspecies. Their name is derived from the cuneate or wedge-shaped form of the tail—each feather decreasing in width symmetrically toward the end and terminating in a rounded point. The Lesser Patagonian Conure, (*Cyanoliseus patagonus*) (Vieillot, 1817) breeds in the south-central part of Argentina from southern Nanquén territory and southern Buenos Aires province to Chubut, migrating in winter north to Mendoza and Buenos Aires, occasionally to Uruguay and apparently in the mountains of Córdoba. It is some two inches smaller than the Greater Patagonian Conure, (*Cyanoliseus patagonus byroni*) (E. Gray, 1831) which formerly inhabited central Chile from Aconcagua to Valdivia and is now confined to a few localities in the mountains of the central provinces.

The basic colouring of *Cyanoliseus patagonus* is olive-green with a blackish cast, darker on the upper parts, almost black on the forehead and crown, and paler on the underparts. There is a very narrow white band across the upper chest which ends in white spots on the shoulders. The abdomen is yellowish with red flecks, with a reddish area in the centre; lower ends of the thighs are red. There is a very prominent white ring around the eye; the bill is black.

During the spring of 1967 a pair of Lesser Patagonian Conures were purchased from a local dealer and after a period of acclimatisation they were transferred to an outside aviary measuring 15 ft. × 17 ft. 6 ins. × 7 ft. This aviary has a layer of washed river sand some 18 ins. deep on the floor. No signs of breeding were observed until late April 1970.

D



Lesser Patagonian Conure excavating nesting hole

despite the fact that several suitable nest-boxes plus a hollow tree trunk were offered. The first nesting activity was in the form of excavating a number of holes in the hard-packed sand of the aviary floor, some of these being only several inches deep while others were up to three feet in length; one of these widened into a dome-shaped nesting cave about 29 cms. in diameter and appeared to be lined with small feathers; the conures had moulted out only a few weeks before this hole was examined. Digging was achieved by loosening the hard-packed sand with the beak and passing the material under the belly to the feet which in turn then kicked the sand backwards a distance of some four to five feet. On several occasions both birds would be out of sight down the longest hole, sending out great sprays of dampish sand through the entrance hole.

This activity continued until late June and upon examining the longest of the tunnels I found one dull white egg. This was of a rough and chalky texture, rounded in shape and measured 28.3 mm. \times 22.9 mm. No attempt was made by the conures to incubate that year.

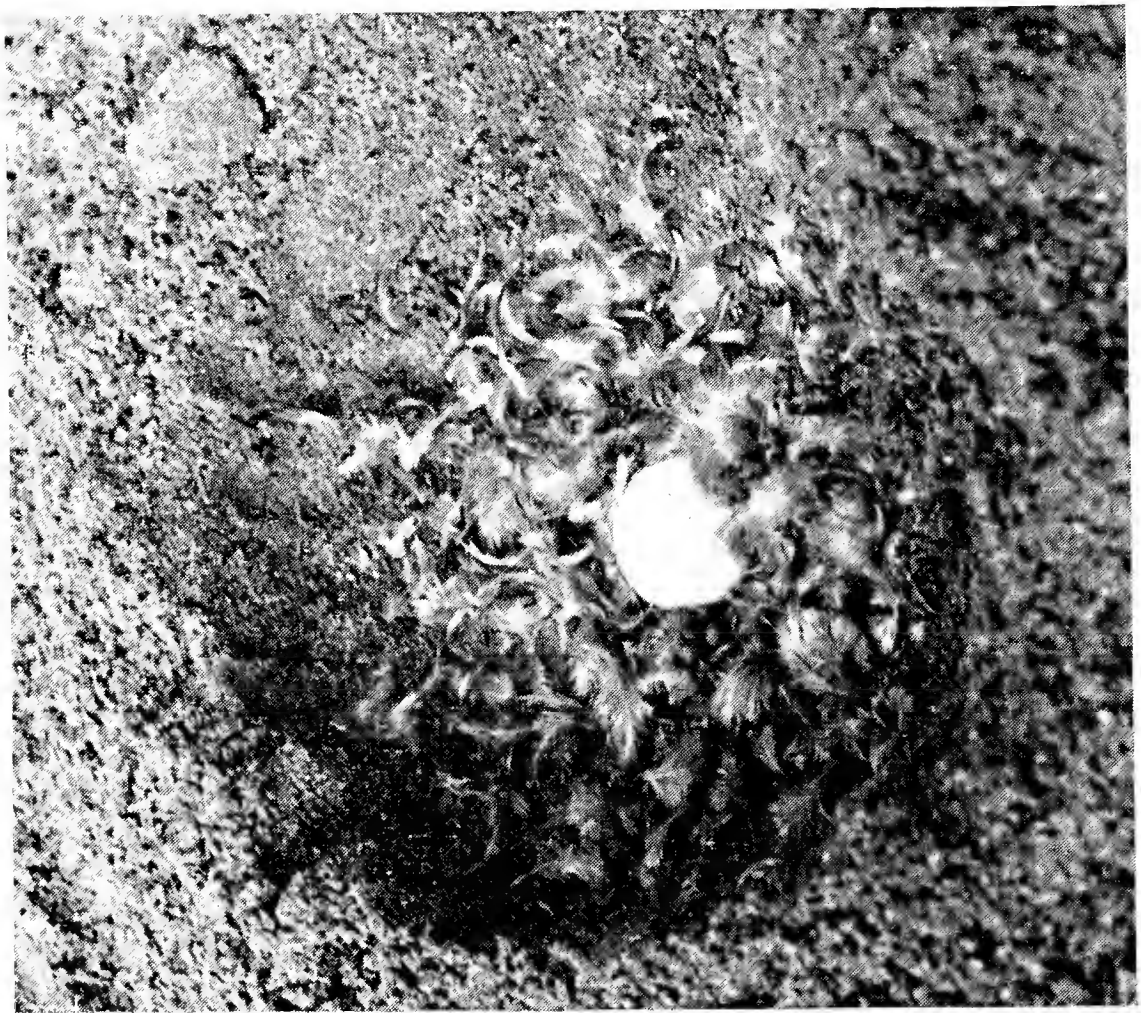
On the 28th April 1971 I decided to move the pair of Lessers to a new range of breeding aviaries which had solid concrete floors onto which I had spread a layer of washed river sand to a depth of some three or four inches. The aviary measures 23 ft. \times 8 ft. \times 6 ft. 6 ins. Several nest-boxes were offered but the pair showed no interest at all until the 14th May when a box 16 ins. square, 3 ft. 6 ins. tall, placed on a wooden frame which brought the entrance hole 5 ft. 6 ins. above the ground, was placed in the flight. First interest was confined to chewing the outside of the box, followed by both birds sleeping inside all night. On the afternoon of 24th May 1971 the female went into the nest-box on her own and was not seen again until the 30th May when the male was observed feeding her at the entrance hole. I found that the male could be distinguished from the female by his slightly larger head and beak and also the reddish area on the abdomen appeared to be deeper in colour.

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[Kenneth W. Green

Adult Lesser Patagonian Conure
emerging from nesting hole



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Nest of Lesser Patagonian Conure.
Excavated to show egg and nesting material

On the 18th June I heard very faint squeakings coming from the nest-box. Up to this time the male was never observed entering the box, but soon after hearing the young calling he was seen regularly entering and leaving in order to help with the feeding of the young. From my observations I worked out the incubation period at around 25 days. The nest-box was not inspected until the 22nd July and was found to contain four young conures in subsequent stages of development, confirming that the Lesser Patagonian starts incubation immediately after the first egg has been laid and this usually results in a family of young of various ages and sizes. On the 17th August one young bird was seen perching at the entrance hole of the nest-box, being fed by both male and female, and by the 20th a second chick was at the entrance hole. These two entered the nest completely on the 31st August and a third specimen on the 1st September 1971. The fourth chick must have died early in development.

The three young were almost identical in colour to the adults, with the exception of the upper mandible which was bone-white in colour. All conures are fed on a mixture of sunflower seed, two parts of canary seed to one part each of millet, oat groats, a little hemp and peanuts with plenty of fruit daily, in particular apples cut into quarters. Supplements include soaked in nectar mixture, lettuce, sprouted grains and celery tops fed in small amounts. Cuttlefish bone is available at all times as a source of minerals. When rearing young conures I find spinach-beet, shepherd's Purse (*Capsella bursa pastoris*), Watercress (*Nasturtium officinale*), Dandelion (*Taraxacum vulgare*) and Chickweed (*Stellaria media*) are all invaluable in the breeding season.

Regarding giving nectar to conures, during the spring of 1966 I watched *Aratinga pertinax* on Curacao and Bonaire eating the flowers of *Leavenworthia sepium*, which according to the local people are known for their richness of nectar.

The Lesser Patagonian Conure is one of the many species of birds which I feel must be bred by Zoological Gardens and aviculturists as so many other species it is gradually becoming much scarcer in the wild. Willaim G. Conway, 1965, states that years ago the Lesser Patagonian wintered as far north as Buenos Aires and could be found in dense flocks. Today it is much more rare; the furthest north that he has seen them was only 75 miles north of Bahia Blanca. There are still large numbers in a few places but due to their fondness for the farmers' crops they are shot in considerable numbers. Shooting, states Conway, is easy for it is said that the flocks show great distress when a member is shot and circle over fallen companions, thus offering the hunter the opportunity of repeated shots.

It would be a great tragedy if this spectacular bird was to follow the fate of the Carolina Conure, (*Conuropsis carolinensis*).

REFERENCE

CONWAY, WILLIAM G. (1965). Apartment-Building and Cliff-Dwelling Parrots. Animal Kingdom, New York Zoological Society.

As described above the Lesser Patagonian Conure *Cyanoliseus patagonus* has been bred at Chester Zoo. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

CAGE BREEDING SENEGAL PARROTS (YELLOW BELLIED)

(*Poicephalus senegalus senegalus*)

By ROBERT NELSON (Coquille, Oregon, U.S.A.)

My first pair of Senegals, newly imported, were acquired in March 1971. They were in perfect feather and health, and seemed obviously a true pair with drastic differences in general stature and cranial structure. The male being over-all just more dominant and masculine in appearance. The female being quite delicate and refined by comparison.

Due to cold weather at the time, they were placed in a cage measuring 18 in. \times 24 in. \times 48 in. in a corner of one of my basement birdrooms and due to lack of space in the outdoor flights later on, here they have remained. It seems that my collection continues to grow more rapidly than outside pens can be constructed, and the larger birds always get the first chance at the more roomy flights.

Although always shy, the little Senegals seemed quite content in their new environment, and I observed mutual preening many times. In April 1971, I observed courtship advances and feeding of the hen by her devoted mate. With these observations in mind, I decided to provide a nest, although I really must admit I did not actually expect results from such shy birds in such close confinement! I provided a cockatiel nest 10 in. \times 10 in. \times 14 in. which I hung at an angle, so if disturbed they would not pounce on the nest contents in their haste. Within minutes the hen was in the nest exploring, and in less than an hour was busy redecorating and remodelling! Throwing out the bits of sawdust and rotten wood I had included as nesting material and that which was allowed to remain was eventually pulverised almost to dust. The male also entered after a while, and they kept quite busy for several days. Of course my optimistic nature came to the fore with all the activity, and I expected eggs soon to follow. Such was not the case! Although the

and not sleep in the box, many hours each day were spent inside. After weeks passed and no eggs appeared, my optimism waned and I did not even bother to peek for weeks at a time. Then, one day in August, around the 20th if my memory serves me correctly, I happened to look into the nest, and could see two eggs. I did not peek into the nest again, but on 4th September an eggshell was thrown from the nest, and I could hear the cry of a new arrival within. I managed to contain my curiosity until 14th September when I could see two small grey balls of down alongside the parent bird in the nest. On 25th September I went into the nest to remove the babies for handfeeding, and was delighted to find three fat youngsters!

They responded well, indeed, to a diet of cooked wheathearts with a little sunflower meal added. All three babies grew into fine strong birds, usually a bit larger than their wild-caught parents. They started pecking at seeds when twelve weeks old, but I did not consider them independent until they were a full sixteen weeks old. They are now adorable, gentle little birds and simply *beg* for attention. A very delightful change from their very shy parents, to be sure. It may be a bit of trouble to hand-feed baby parrots, but I feel that the end result of such very tame and trusting birds is worth the extra effort, and besides if you really love birds *it is such fun!*

While the parent birds were feeding their babies, they ate heavily of safflower seed and sweet corn (on the cob) with, of course, the usual sunflower and a few oats and millets. My Senegals seem not to like any other seed, nor would they consume soaked sunflower and fruit which so many parrots seem to love when assuming the task of feeding a nestfull of hungry kids. The hen rarely left the nest, the male seemingly doing most of the feeding.

I would like to know of others who have raised these lovely little parrots in their aviaries. At the moment I am aware of only two other breeding pairs in the U.S.A. I would be pleased to correspond with anyone regarding breeding of these birds, and would endeavor to answer all questions. I have acquired several other imported Senegals, and plan to keep all that I can raise for a while, in hopes of eventually developing up an aviary-bred strain of these beautiful and charming little Senegal parrots.

* * *

BREEDING OF BEWICK'S SWANS AT BENTLEY

(Cygnus columbianus bewickii)

By JOHN SECRETT (Wildfowl Trust, Glos., England)

Bewick's Swans are notoriously difficult to breed in captivity. The only previous success recorded has been by the Wildfowl Trust at Slimbridge (Johnstone 1957), whose female nested from 1956 up to the time that her second mate died in 1969.

In early May 1970 a pair of Bewick's, both descendents of the Slimbridge birds, nested for the first time at the Bentley Wildfowl Collection. The fine collection, situated close to Lewes in Sussex, was started in 1962 by the late Gerald Askew and is now maintained by Mrs. G. Askew. On this occasion, three eggs were laid but, regrettably, were lost to crowding.

On 4th May 1971 the Bentley Bewick's once again set about nesting. The female showed much interest in a large pile of twigs and rushes which had been provided some ten yards from the pond, and on 6th May the first egg was laid. Its measurements of 67 mm. \times 109 mm. were similar to those of five eggs laid at Slimbridge by the bird's mother (70.5 mm. \times 106 mm.). Another four eggs followed on alternate days and on 17th May the female began her 30-day incubation. A point of interest was that only four yards away, in the adjacent pen, a pair of Trumpeter Swans were also nesting, yet no aggression was ever seen between these four birds.

The female Bewick's sat very tightly and was seldom off the clutch. Everything progressed well to start with but, as incubation was entering its final stages, the weather, which had not been good anyway, deteriorated quite alarmingly. For days there was torrential rain and many nests throughout the grounds were deserted because of waterlogging. As a result, as this, young goslings already out on the grass were getting chilled and then contracting pneumonia. With just four days to go before hatching there was serious flooding—water had already reached the Trumpeter nest—and there was little alternative but to bring the Bewick's eggs to safety. At this stage they were candled, and it was clear that only one was going to hatch. Of the other four, three were addled and one was infertile. Fortunately the rain eased off a little and the flooding subsided enough to make it possible to return the eggs to the female. In the meantime had been sitting on dummies. There were just four days left before hatching.

On 16th June a small downy white cygnet could be seen peering from under the wing of a very proud mother. The male Bewick's was also obviously excited about the new arrival and spent much of his time beside the nest. Then, just as everything seemed to be going well, the weather took another turn for the worse. The female stayed on the nest for two days sheltering her young from the deluges of rain.

and water dishes were placed on the rim of the nest and from these the cygnet fed readily. On the third day after hatching, it was bright and sunny and for the first time the cygnet was led to the water by the mother bird. There was little problem in feeding the young one. It grazed enthusiastically and adapted well to chick starter crumbs. An assortment of pond and water weeds, such as duckweed, watercress and floatgrass, was provided in the early stages. At seven weeks the cygnet was beginning to feather over the scapulars and by 13 weeks the last traces of down had gone. This bird was moved from Bentley to the Wildfowl Trust in October 1971 where it can now be seen in the Rushy Pen together with other collection Bewick's and many wild ones also. On release (at four months old) it weighed 10 lb. 8 oz. and was sexed as a female. It is hoped that in a few years she will help to make up another, much needed, breeding pair at Slimbridge.

Also reared at Bentley in the 1971 season were another 43 species of ducks, geese and swans. In addition, 16 species produced clear eggs. It is hard to guess the cause of this disturbingly high infertility; it may be due to several factors such as incorrect pairings, interference by surplus males, old age, etc. Perhaps the most exciting young reared were seven Black Brent, these being the first ever at Bentley. In all, four females laid at roughly weekly intervals, 14th May, 22nd May, 30th May and 7th June. An unusual feature was that the last two females were paired to the same male. He defended both nests, which were only 20 yards apart, and both females were fertilised. Although polygamy is not particularly unusual in temperate-region geese (Ne-ne, Swan Geese, Large Canadas, and Greylags), this is the first time I have noticed it in an arctic goose species. Two pairs of Cereopsis geese reared eight goslings between them (five and three). These birds always do well at Bentley; the abundance of good grass throughout the year must be one reason for their success. With a further two pairs of Cereopsis approaching breeding age, it looks as though many more ought to be reared in subsequent years, an encouraging thought considering that this species has a world population of under 6000. Six young Ne-ne (an even rarer goose, now numbering about 1,000) were produced from two adult pairs. Only one other Ne-ne has been previously reared at Bentley, in 1970. The Emperor Geese were also reasonably successful. Four males laid, two on 9th May, one on 10th May and one on 13th May. Their eggs, except for one clear clutch, had an excellent fertility record. Sixteen young hatched from 18 eggs and of these, 13 were finally raised. Other interesting young reared included Whooper Swans, Black Swans, Swan Geese, Magellan and Ashy-headed Geese, Lesser Whitefronts, Ross's, Eiders and Maned Geese.

REFERENCE

HIRSTONE, S. T. 1957. Breeding of Bewick's Swans. *Avicult. Mag.*, 63, 27-28.

SUGAR-BIRD TANAGER HYBRIDS

By J. DELACOUR (Clères, France)

It has long been my contention that the various birds considered as members of the Sugar-bird family (*Coerebidae*) with the exception of those of the genus *Coereba*, really are Tanagers (*Thraupidae*). They have the same general habits and behaviour, and their colours and plumage patterns are similar. Some species of *Dacnis* and *Iridophanes*, long considered as Sugar-birds, actually differ from Tanagers of the genera *Pseudodacnis*, *Chlorochrysa* and even *Tangara* only very slightly in their more or less longer, thinner and more curved bills, while their plumage is practically identical. My belief in their very close relationship as members of the same family (*Thraupidae*) has just been highly supported by the recent production of hybrids between two species of Sugar-bird and Tanagers, differing more from each other than a number of others, which are intermediate.

During 1971, several broods have been reared at the San Diego Zoo from a pair consisting of a male Yellow-winged Sugar-bird (*Cyanerpes cyaneus*) and a female Mrs. Wilson's Tanager (*Tangara nigrocincta fanny*), two species of fairly different shape, plumage and size. The sexes, in the Sugar-birds, are very different, the male brilliantly royal blue and black, with an opalescent crown and yellow patches in the wing; the female dull olive and grey. Both sexes are alike in Mrs. Wilson's Tanager mostly light blue and black, with a white belly. Yellow-winged Sugar-birds have the longest bills in their group, while in Mrs. Wilson's Tanager it is short and rather thick.

The hybrids are intermediate and generally resemble Sugar-birds of the genus *Dacnis*. The males are a light blue with a white belly; the female resemble them but show much grey on the head and neck.

It is interesting to note that there are many other Sugar-birds and Tanagers in the large planted aviary, through which visitors walk continually in the day. It is therefore not because of a lack of more appropriate mates that those birds have paired up and bred together. Mr. K. C. Lill, the Curator of Birds at the San Diego Zoo, will soon publish details and coloured photographs of these very significant hybrids. It would be of great value to have the proof of their possible fertility.

THE SPACE REQUIREMENTS OF SMALL BIRDS

By C. J. O. HARRISON (Berkhamsted, Herts, England)

To summarise the information for those who do not wish to read it in full:- To avoid overcrowding or unduly confining birds some rules are needed for calculating a minimal space allowed for each pair. An examination of the space allowed by various persons successfully keeping birds, suggests that for birds of finch size, in an indoor situation where space is very limited, 50+ or preferably 70+ cubic feet per pair could be allowed; and in outdoor aviaries 100+ to 350 cubic feet per pair, or more, should be allowed. The greatest dimension should be the length.

I appreciate that discussion of this subject in this journal involves, in the majority of cases, preaching to the converted; but I think that we could take a lead in putting forward, and discussing, such ideas.

One of the failings of which bird-keepers tend to be guilty is that of overcrowding birds, or of offering too little space in individual enclosures. There are several reasons for this. Newcomers to birdkeeping are offered the commercially available all-wire cages which are far too small, breeding cages designed for canaries and budgerigars which can adapt themselves to extremely limited accommodation which most other species will not tolerate. They may also see birds at shows in tiny show cages and although they may know they cannot keep birds in these they tend to assume that the birds will not need much more space at other times. More experienced bird keepers who have kept only canaries and budgerigars and who come to keep other native species or foreign birds, appear at times unable to grasp that the requirements of these might be different. Presumably in time it might be possible with some species to produce tolerant strains like those of the domestic canary; but I doubt if our more civilised age should tolerate the savage indifference to well-being that this entails, and most people would prefer to try to give a bird the conditions that it needs for its comfort.

It is difficult to discuss this subject because there are so few standards available by which to measure space requirements. With most bird species the problems are similar to those encountered when keeping fish, in that three dimensions of accommodation are involved. The fish-keepers overcome their problem by adopting a rough rule-of-thumb which allows a certain amount of cubic space per inch of fish. I think we could try a similar system for birds, although it would be easier to use a few size categories rather than precise units of length.

Now I am well aware that a number of other factors may be involved in successfully accommodating small birds, varying with the species concerned. I am also aware that although a size in cubic feet can be given, space may be more desirable in one direction than in the other.

The greatest length is an important factor and a narrow, horizontal aviary would be more desirable than a narrow vertical one. In spite of such considerations I am convinced that we need some general figures to start with.

Having calculated my own space allowances for various birds I made a random check through publications such as the *Avicultural Magazine* and *Cage and Aviary Birds*, noting such measurements; and more recently, at an A.S.P.E.B.A. A.G.M. I asked the members present to note down the space they allowed per pair of birds. The data that I have are mainly for finch-sized birds, both seed-eating and insectivorous and for a few thrushes and small doves. The people questioned were concerned with keeping birds under conditions which would encourage them to breed.

It was interesting to discover that there was a general measure of agreement. From the data the figures that I have given above emerged. Most people keeping birds inside birdrooms, where space was limited would allow for finch-sized birds at least 50+ cubic feet per pair, and usually 70+, although one had some success with 40 cubic feet, and the inevitable exception occurred. In that case Redstarts had bred in a cage 8 ft. \times 1 ft. 4 in. \times 1 ft. 4 in. The cage length may have been relevant. I think such exceptions will continue, but I greatly doubt that they will lead to consistent and long-term success in either keeping or breeding of birds. For outside aviaries there was one at 96 cubic feet per pair, the others ranging evenly between 100 and 360 cubic feet. I think one could take these figures and make reasonable proportional allowances for larger species. I do not suggest that the measurements given above represent the ideal situation. It is possible that they are minimal sizes. To most aviculturists the suggested space allowances quoted above are probably not novel, but it is of interest to compare these figures with those for the structures in which many birds are kept. Most commercial bird cages have a capacity of 2-3 cubic feet; and rarely may rise to 4-5 cubic feet. The various "breeding cages" offered also fall within this range, and none begin to approach the suggested dimensions. I think that these small structures have done much to discredit bird-keeping in the eyes of outsiders. The birds they see; the birds in the shops, and at the shows, and the wretched family Budgerigar, are in quarters so confined that anyone who has seen a bird in its natural state, even if it is only a sparrow or a starling, is likely to feel some uneasiness.

I think it is up to us, as aviculturists, not merely to take a holier-than-thou attitude and to say "But of course that isn't the way *we* keep them" but to take the more positive one of offering some elementary general guidance as to what we regard as the desirable minimal dimensions which (other factors being favourable) should not disappoint the hopeful novice bird-keeper, and might go some way towards meeting the objection of those who believe that the sight of a bird deprived of the opportunity for movement of the kind for which it was evolved is a discredit to the culture that permits it.

BREEDING MALABAR \times PAGODA STARLINGS*Sturnus malabaricus* \times *S. pagodarum*.

JOHN A. PURVES (Edinburgh, Scotland)

The article by Mr. Raymond Franklin on the breeding of Malabar Starlings in the November/December issue of the AVICULTURAL MAGAZINE prompts me to write about my own experiences.

I had a pair of Malabar Starlings and a pair of Pagoda Starlings and during the course of a few years I lost one of each species.

The odd bird of each pair was flying with a mixture of birds—Pekin Robins, weavers, whydahs, etc.—in an aviary approx. 18 ft. \times 8 ft. \times 6 ft. 6 in. in 1969 and in June of that year I noticed that when I put in the usual ration of mealworms that the starlings were not eating them but carrying them away. A close watch revealed that they did in fact have a nest of three young in a nest-box larger than a finch nest-box but similar with half of the front open. The box was in the shelter fully 6 ft. from the ground. Any movement at all brought the sitting bird off the nest and so I knew nothing about it till I saw the live food being taken away.

The young survived for only about a week but the pair started again in the same nest and laid four eggs. One egg was infertile but three young were fully reared on a diet of mealworms and maggots and whatever else the parents could find in the planted flight.

One of them had a black head like the Pagoda hen; one had a black head with a small white patch at the front; and the front half of the third one's head was white with the back half black.

During the winter of 69-70 the old Pagoda hen and the black-headed young bird both died so that I was left with old cock Malabar and two young birds which were a cock and hen.

No breeding took place during 1970 but the old cock was always with one of the young birds and kept chasing the other bird away from the food pots so in the spring of 1971 I placed the two of them in a smaller aviary by themselves. Nest building, laying, incubating and hatching took place three or four times, but the young always died when about to leave the nest so in desperation I opened the aviary to allow the parents to fly outside because I thought that perhaps the live food supplied was too monotonous. For almost a week neither bird went outside and then the hen came out and was never seen again. I can only suppose that she got a fright and then could not find her way back to the aviary. The cock bird never even attempted to feed the family who were now about ten days old so this finished my breeding attempts.

The old Malabar cock died (how old I do not know but he certainly looked old) in the autumn of 1970 so that I was left with only one 1969 youngster. He is a tough healthy bird in very pink of condition and with

each moult his head becomes whiter. The front three quarters is now white and the back one quarter black.

I am not at all keen on breeding hybrids but when "mistakes" like this happen it is most interesting to see how the young turn out and also to prove that they are fertile.

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BREEDING D'ARNAUD'S BARBET AT WINGED WORLD

Trachyphonus darnaudii emini

By BRYAN S. WARD (Heysham, Lancs., England)

D'Arnaud's Barbets are one of the Ground Barbets, and are slimmer and more dainty than the better known members of this large colourful family. There are five species of *Trachyphonus*, *T. darnaudii* being six inches in length and the smallest of the genus.

The upperparts are brown, spotted and barred with white on the back, wings and tail; underparts are yellow, spotted with black on the breast, under tail coverts red. Forehead and crown black. The chin and throat are black also, spreading down to the breast. The sexes are alike with the male having a little more black on the crown and throat, and being slightly larger.

We purchased a trio of *T. darnaudii emini* in 1970 and put them into one of our glass fronted compartments with an odd bird of the *T. darnaudii* species where they lived together amicably for several months. During this time a number of holes were excavated in the soil, to varying depths, always adjacent to either walls, rocks, or some solid object, but all were ultimately abandoned or caved in.

Towards the latter end of 1971 our breeding pair objected to the other two birds by chasing them around and generally harassing them, so we removed them to another compartment for their own safety. The breeding pair then continued excavating in various places, presumably looking for a suitable site for nesting. They finally decided on one particular hole and removed the soil to a depth of eighteen inches, they then made a nest chamber to one side of the base of their hole. Until this was made the birds had to back out of the hole tail first, as the nest chamber was enlarged they managed to turn round and emerge head first.

It is difficult to ascertain the incubation period as the barbets continued removing soil during this time, but to a lesser degree. The young birds were first heard thirty days before they left the nest, but the parents were not observed taking any food to them until almost a week later. There was no apparent preference for live food as maggots and mealworms were fed in more or less equal quantities by them. It was then noted that currants,

sultanas and our soft food mixture were also fed in the latter two weeks. As also were day old mice.

During the last week that the three youngsters were in the nest the parents again started removing soil, possibly to make more room for the growing birds. The young birds are very similar to their parents, the only difference being their slightly smaller size and paler colouring.

As described above the d'Arnaud's Barbet *Trachyphonus darnaudii mini* has been bred at the Winged World. It is believed this may be a first success.

Any member knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING AND BEHAVIOUR OF THE NORTH ISLAND WEKA RAIL AT CHESTER ZOO (*Gallirallus australis greyi*)

By WILLIAM H. TIMMIS, Curator of Birds and Mammals.

INTRODUCTION

Long isolation from other lands has allowed the New Zealand native fauna to develop almost entirely free from outside influence. The fauna is not remarkably rich in species, and some widespread groups are either absent or but poorly represented. Nevertheless, no other country has such a wealth of endemic species or so many peculiar developments and adaptations.

The comparatively large number of flightless birds is resultant upon the paucity of land mammals, for lack of competition and particularly immunity from attack by mammals, has enabled certain birds to become ground foragers, which habit has led to heavier build and reduced wings.

The most remarkable flightless birds are the Kiwis, Apterygidae, and the extinct Moas, Dinornis—two extremes in size—the former a little larger than a domestic fowl and the latter up to ten feet or more in height. Both are related to that group of southern hemisphere flightless birds to which belong the modern Ostrich, Emu and Cassowary. The presence of birds of this group can be explained only by the assumption that New Zealand was once part of a great southern land mass.

A century of cultivation and acclimatisation has upset the balance of primeval nature, causing immense changes in the native land fauna. Some species have failed to survive altered conditions and others, once common, are now sadly reduced in numbers, one of the species being the Weka Rail or Woodhen (*Gallirallus australis greyi*). This bird is

slightly smaller than the domestic hen; a tawny brownish and blackish streaked bird with degenerate wings making it incapable of flight.

Sexing is very difficult indeed. Males tend to be heavier than females, 900 gms. against 700 gms. for the female. The Weka can run with great speed, but is most inquisitive and will venture very close to human habitations with a stealthy gait and an enquiring demeanour. In New Zealand the breeding season is an extended one, with the peak occurring in winter and early spring. Weka Rails are multi-brooded and pairs have been known to nest four times in one year. Two to four eggs comprise the clutch, the nest being concealed in thick scrub.

The Weka that we have bred is the North Island (*greyi*) which has more grey on the underparts and brown rather than reddish legs. There are three other races which are as follows:- The Buff Weka (*hectori*); this bird was found in low rainfall districts east of the main range in the South Island. It became extinct in its old haunts but thrived at Chatham Island, whence 16 were re-introduced in February 1962 to Arthur's Pass National Park.

The Weka of the western region of the South Island from Nelson to Fiordland (*australis*) has a streaked red-brown and black breast. In South Westland and Fiordland it is dimorphic, the black form showing much more black in the plumage. "Black" Wekas are not uncommon along the Milford Track and range to the top of the Mackinnon Pass (3,400 feet).

Gallirallus australis from South Island, according to Mr. A. A. Prestwich, was bred at the London Zoo in 1912, two chicks hatching of which one was reared.

The Stewart Island Weka (*scotti*) is slightly smaller. It also is dimorphic, but the black phase is less black.

During visits to New Zealand in 1963 and 1966, I was able to observe several Wekas in the wild, and was told by an old bushman that they have a fascination for taking small shining objects such as spoons and the bushman complained that even watches had been taken.

The North Island Weka, once abundant everywhere, has now disappeared from most districts, largely due, I was told, to the depredation of dogs, cats, stoats and weasels. In 1915, the Weka was most abundant from Waimauku to the Muriwai Beach, west of Auckland. Their shrill calls could be heard any evening in considerable volume and female with their chicks came fearlessly around camps, but today not a single bird remains. In other areas it is still a familiar bird, especially in the vicinity of mountain huts and weekend houses. In such places, it may be extremely tame, even becoming a tourist attraction. I saw several Wekas in the Gisborn area of North Island; the birds have built up from very small numbers to high densities in the last fifty years, even feeding and breeding in suburban gardens. Staff of the Wildlife Division have been trapping Wekas and releasing them into areas where they have become extinct in the hope of re-establishing them.

Wekas occupy a wide variety of habitats. They may occur in tussock country above the tree-line, to 6,000 feet above sea level; in heavy, temperate rain-forest, and in coastal swamps and scrubs.

The nearest allies of this endemic species are the flightless woodrails (*Tricholimnas lafresnayanus*) from New Caledonia.

COURTSHIP AND SEXUAL BEHAVIOUR

On the 4th July 1971 a pair of North Island Weka Rails arrived from the Auckland Zoo. After a short period of quarantine and acclimatisation, they were liberated into a large mixed flight (106 ft. \times 60 ft. \times 20 ft. high) at the rear of the New Ape House, heavily planted with trees and shrubs and two large pools. This flight contains Herons, Ibis, Egrets, Gallinules and Waders, along with a single female Weka which has been in the collection since April 1964. Several days after the introduction, courtship feeding was observed between the original female and the newly arrived male. The female was seen to beg and to be fed by the male. This was repeated every three or four minutes, the male usually carried the food to the female as she crouched on the ground. Sometimes he brought her food from as far as 60 feet, even though the female was not

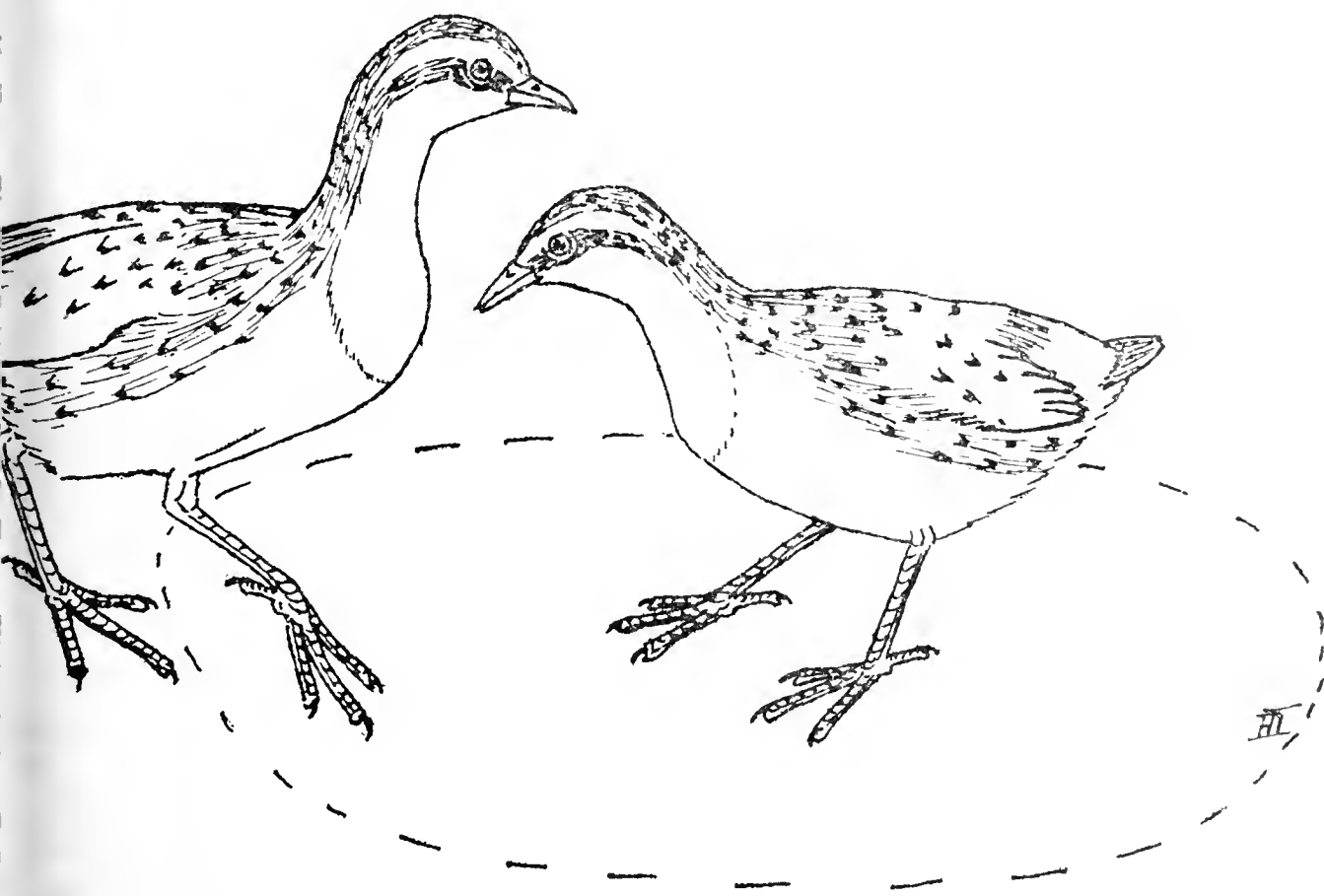


Fig. A. "Male circling Female" in sexual display.

ing. On several occasions the male began to hop around her in small circles with his head held high and his short tail widely spread and bobbing up and down. The female appeared to resent this courtship display and warded off the male, by rotating her head so as always to direct her half-opened bill at him in a threatening manner. The male

made at least twenty circles around her. Later, the female moved under some low bushes and preened for ten minutes, during which time the male moved to the far side of the enclosure. Suddenly the female became alert and gave a low call Kuck-kuck-kuck, followed by louder calls. The male appeared at once from some bushes fifty feet away and fed her. Once he jumped about three times into the air and seized a locust from a shrub and took it to the female, who was not begging at that moment. She swallowed it after a little hesitation.

For several days, the male was observed feeding the female and preening her neck and head; she would turn her head away and fluff up her neck feathers.

Copulation starts with the male passing food objects to the female; the usual food used appeared to be earthworms which he dug up in the enclosure and mealworms thrown on the ground by keepers. He could carry as many as sixteen in his bill at once. These he would feed to the female one at a time, after which, he would preen her neck and head, marking time while preening. He would then step onto the female's back, first with one foot pushing very hard, which made her go into a crouching position. Once he had both feet on her back, she would

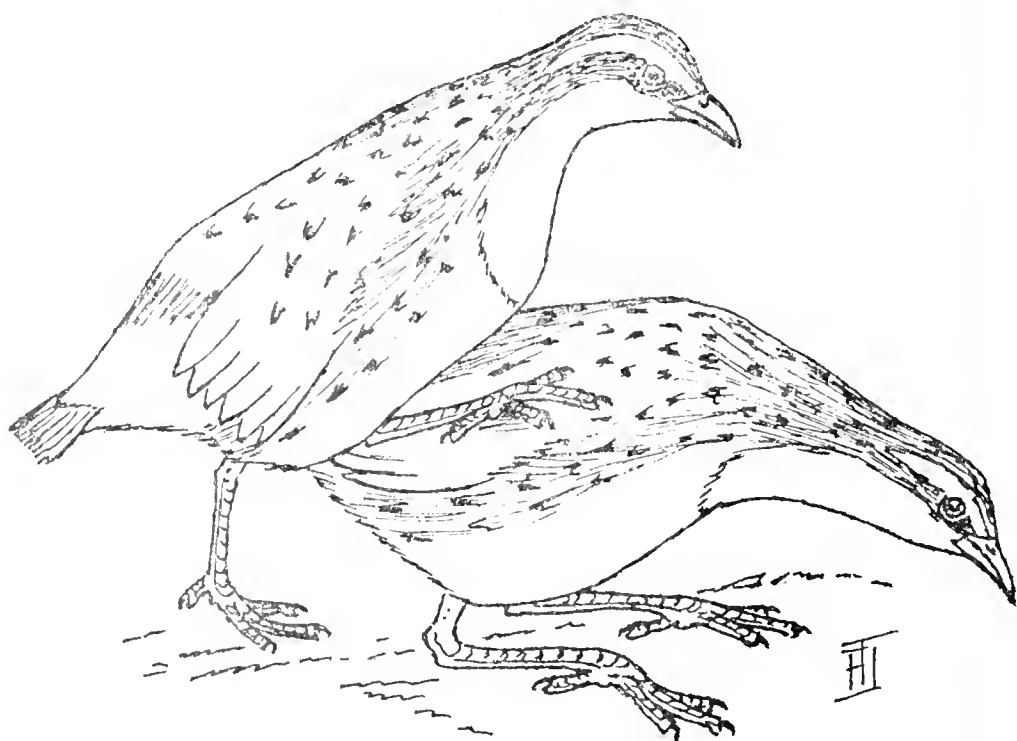


Fig. B. Copulation.

return to a standing position or slightly crouched, sometimes with the bill lifted slightly upwards and in a generally submissive attitude. This position is maintained by a firm grip of the feet and much flapping of the short wings. The tail is depressed and moves vigorously from side to side. The neck is arched and often he would peck at the nape of the female's neck. Mating lasts for three or four seconds, although he would remain on her back for at least twenty seconds. During copulation neither bird makes any calls at all.

NEST BUILDING

The site of the nest was a small cave built out of sandstone measuring 2 ft. 2 in. \times 2 ft. \times 2 ft. 6 in. The nest was built in a corner of the cave, and composed of bits of grass, pieces of rushes, twigs and a few odd feathers. It was lined with finer grasses and moss. The nest was in an ideal position for observation, facing a window in the New Ape House kitchen. The Wekas could be watched without disturbing them at all, from a distance of less than five feet.

Both male and female brought nest material and both sat on the nest and shaped it—prodding with the bill or stamping with the feet. On one occasion the male, arriving with a new bundle of material, literally pushed the female off the nest. Towards the completion of the nest, I got the impression that the male brought most of the material, while the female did most of the sitting and shaping. As with most birds, the nest materials added while the birds were incubating, at least in the early stages. During the nest building period both male and female appeared to be very restless; the female would call loudly, Kuck-kuck-kuck, whereupon the male would rush from whatever part of the flight he may have been at the time, to the calling female and indulge in a short period of communal calling, followed by begging and neck preening. This

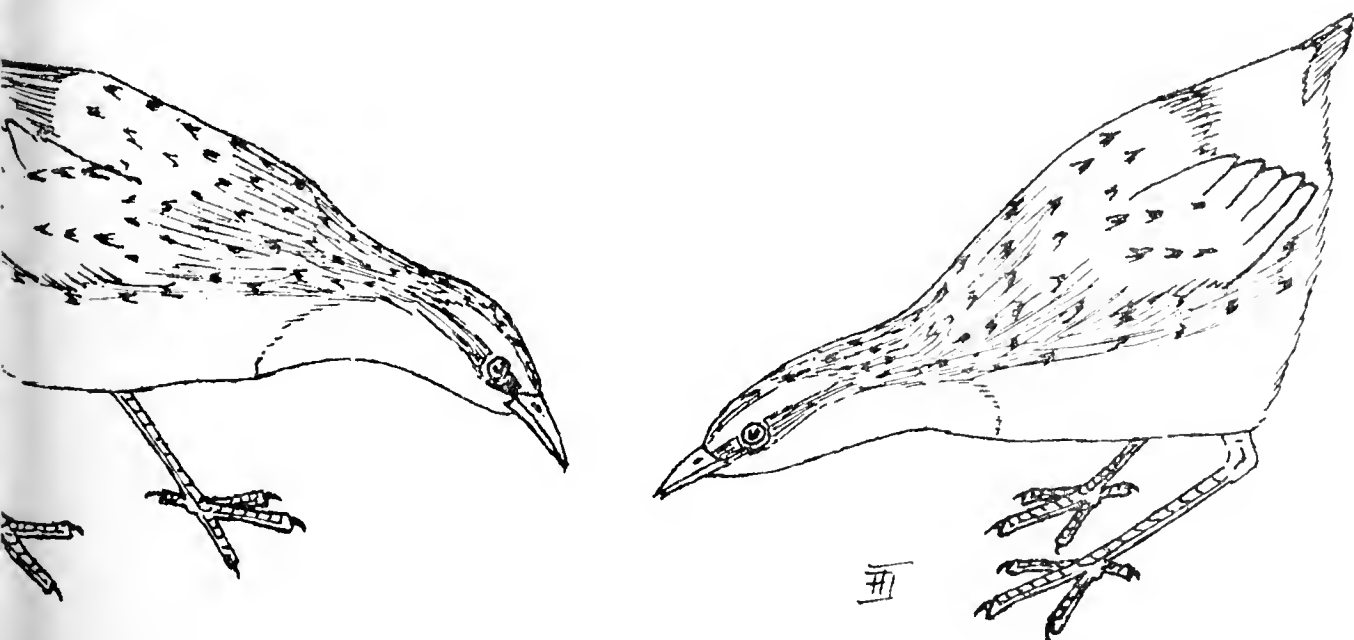


Fig. C. Communal Calling.

usually lasted about 30 seconds. The birds do not bring material on every trip to the nest. When they have been away for some time, they frequently go directly to the nest and the female then often works for an unusually long time. During the later stages of nest building, the male would remain near the nest without working on it.

INCUBATION

The first egg was laid within a few days of completion of the nest, three eggs being laid within a period of five days. It was very difficult to learn with any accuracy, the interval between the laying of each egg. Incubation appeared to commence with the laying of the first egg. One would assume that with Weka Rails being omnivorous eaters there would be no eggs left if incubation began only when the clutch was complete. Whether the adult birds sitting on the eggs for long periods of time during the egg laying period means that the eggs are being subjected to full incubation heat, I am not sure. This obviously depends upon the stage of development of the brood patch and how well it is formed at the time.

The egg is typically ralline, creamy-white with scattered brown and light purplish blotches measuring 61 mm. \times 41 mm.

Both birds took part in incubation; the changeover display when one bird relieves the other at brooding on the nest, is done with the presentation of an earthworm, small twig or nest material. At times the bird sitting would be unwilling to leave the nest, and did so only by being shouldered and pushed off by its mate.

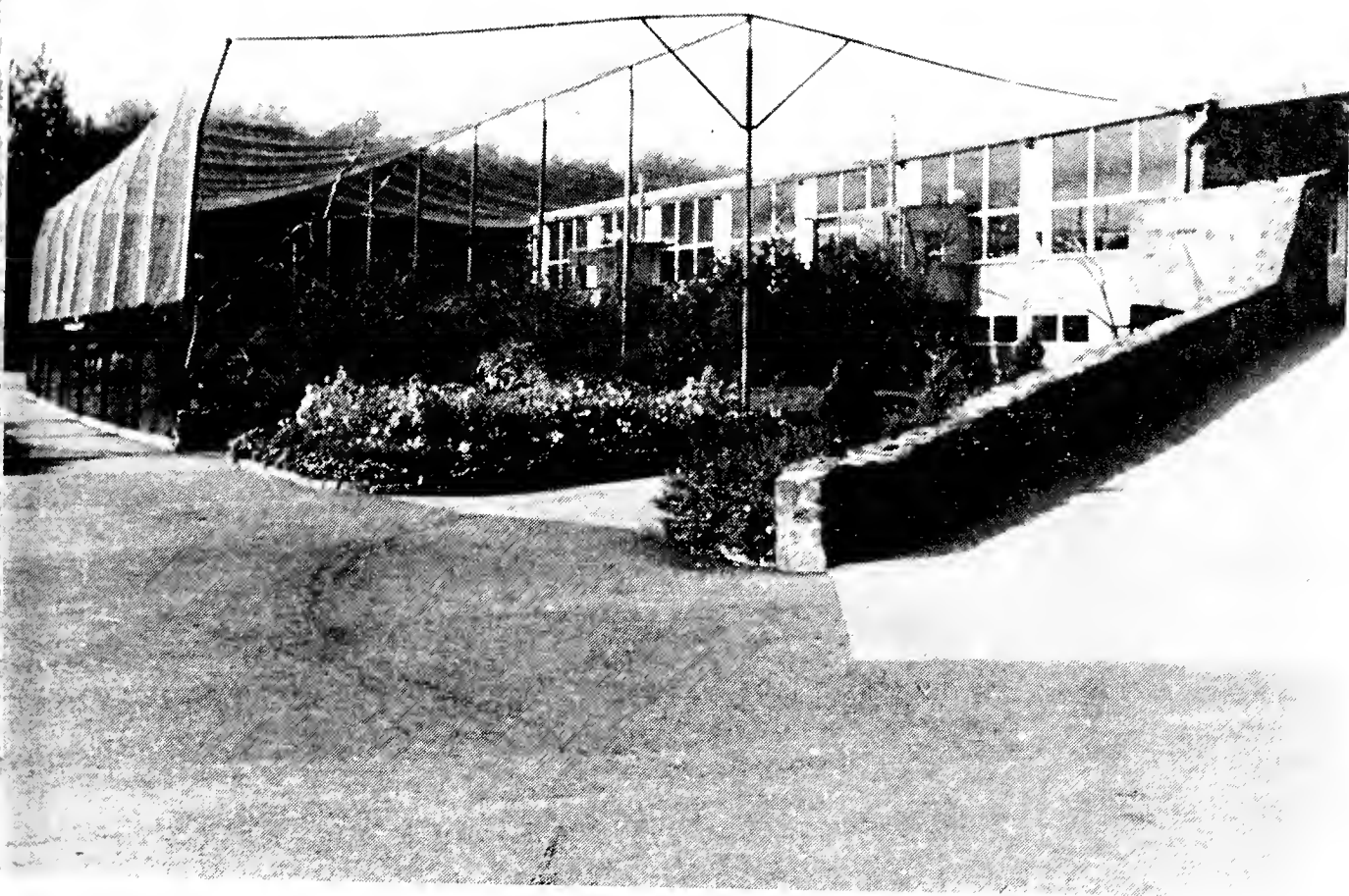
They usually spend the time away from the nest in feeding, preening or occasionally in bathing. They would walk out into the shallow part of the pool, bowing forward and twisting their bodies so that their heads were dipped into the water; or lying down on one side and then on the other, flapping quickly with their wings, the necks are moved sideways throwing water on to the back. After a short while the wings are soaking wet. Sometimes the bird only dips its head in and out of the water and with a sideways movement of the head, throws water onto its back.

After bathing the Wekas usually shake themselves, fan out the wings and shake their heads and bodies several times. They then spend considerable time preening and drying their feathers by adopting sunning posture; now and then there is vigorous flapping of the wings.

The male often indulged in squabbles with other birds in the flight especially with a pair of Pond Herons who had a nest a short distance from the Wekas' territory. The female spent more time in preening quietly standing under the cover of shrubs, than did the male.

Swimming was observed only once, when the male swam across the top pool. The body was held high out of the water, the head jerking rhythmically backwards and forwards and the short tail flicking up and down.

The eggs were turned by the sitting bird at varying times during the day—I was unable to record any observations at night. In most cases it was noted that after the eggs were turned—with the beak and legs—the bird also turned around to face another direction on the nest. The incubation period was 26 days and when the eggs were about to hatch the bird turned them more frequently.



General view of Aviary in which the Weka Rails were placed



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Weka Rail, 6 weeks old

[Kenneth W. Green



Weka Rail, young bird digging for insects



Copyright]

[Kenneth W. Gr

Adult male Weka Rail carrying insect larva

Two eggs hatched and within four hours the chicks had left the nest and were hiding under vegetation several yards away. No feeding was served at all and the parents appeared very nervous. Several times both male and female attacked and drove off Pond Herons, Glossy Ibis and Maned Geese from the vicinity of the chicks. The Wekas fluff out their body feathers thus increasing their apparent size and fan their drooping wings all the time, making a deep booming sound. The following day both chicks had vanished, possibly eaten by a pair of Common Herons or Nankeen Night Herons.

Within five days the female was sitting again on the same nest and incubated for 27 days from the laying of the first egg, three eggs being laid as at the first time.

THE CHICKS

The chicks could be heard chirping in the eggs before and during hatching. At 9.50 one morning an egg was chipped and the egg tooth and part of the head was showing; slight cracks were visible in a second egg. At 10.44 a.m. the eggs were in a different position, cracks down; these had been turned by the sitting bird. At 11.30 a.m. a chick had emerged and half of the shell had disappeared, the other half was still attached and the tail end of the chick.

The second chick hatched the following morning, almost twenty-four hours after the first. I was able to watch the final stage of hatching and saw the chick squirming and rotating slowly in the shell in such a way that its head turned under one wing, moving backwards; the upper part of the bill was constantly brought to bear against a fresh portion of the shell which was then chipped off with each outward push. With each push the chick emitted a very weak cry. Even before breaking the shell, the chicks understood the calls of the parent birds, ceasing their reduced chirping the moment they heard the alarm or anxiety call, *kek-tewk-tewk*.

Upon leaving the eggshell, the young Weka lay wet and exhausted in the nest, alongside the first chick. No help at all was given by the parent attendance. The chicks dried very quickly, eyes wide open and both very alert; they were almost jet black in colour with a very slight trace of grey. The male took half an egg shell which was just outside the nest and dropped it some thirty feet or so from the nest.

At first the chicks were brooded almost continuously. Usually each parent remained covering them until the other arrived with food. It would appear that the chicks were not fed very frequently for the first few days and the brooding continued constantly for about six days. The parent birds became very agitated if the chicks moved from under them. On the 10th day, I noted that the chicks were allowed to move around outside of the nesting cave, even going up to ten feet away before the parent bird called them back. On occasions a chick refused to return to

the nest and it was carried by the brooding parent who picked it up by the nape of the neck and dropped it into the nest area. Several Ornithologists have reported seeing adult Water-rails (*Rallus aquaticus*) carrying young in their bills.

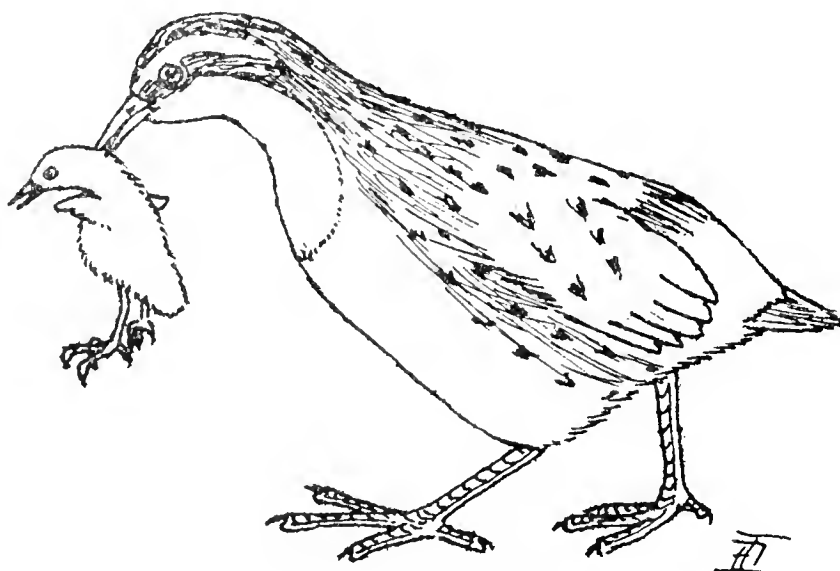


Fig. D. Carrying Chick.

FEEDING THE CHICKS

The chicks beg by crouching and then standing upright, follow touching the bill of the parent, who then gives the begging chick whatever it has in its beak—earthworms, mealworms, maggots, etc. On several occasions, I thought I could see small quantities of saliva being passed by the feeding adult along with the insect food. It appears that when the chick is young and not demanding large quantities of food, the adult Weka can store food in its crop or gullet, as I quite often observe regurgitated food which the chick took from near the tip of the beak of the adult. This is done several times until the chick is satisfied, when it then settles down and begins to doze.

As the chicks grow in size they move further away from the nest, although the parents continue to be very concerned about them and in the event of anything strange occurring, the adults would give an alarm call—Koo-koo-koo, whereupon the chicks would crouch down on the ground or run for cover under the nearest available shrub or tussock grass and wait for the all-clear.

The food of the Weka consists largely of insects which they obtain both from the ground and among low foliage and to a much smaller extent of berries and other fruits. They vary their diet with an occasional small mammal and possibly nestling birds. A friend of mine in New Zealand observed a Weka catch a green Gecko (*Naultinus elegans*) and states that they catch and eat the brown Skink (*Lygosoma moco*) and a fascinating insect called the large-headed Weat (*Hemideina megacephala*) which one hears in most parts of New Zealand making a peculiar scraping sound by rubbing their hind legs against ridges on the sides of the body.

the body of this remarkable insect grows to about 2 in. in length and the antennae are up to 4 in. long. They apparently belong to the Cricket family.

In our large flight they hunt for insects among the long grass and low shrubs. Each day we release locusts of various sizes and allow the Wekas to hunt them naturally. From time to time one would see a Weka leap a foot or so above the herbage to snatch an insect which had tried to escape. Digging for earthworms appears to be their favourite occupation and this is done very efficiently. Usually the male searches for food in the ground and the head is swung from side to side with the bill pointed in the direction of movement. spurts of soil are thrown first to one side and then to the other. The male is followed by the female who does the actual worm catching. She in turn passes worms to the chicks who wait a few feet away from all the activity. The birds tend to comb a very restricted area thoroughly and patches of ground become completely

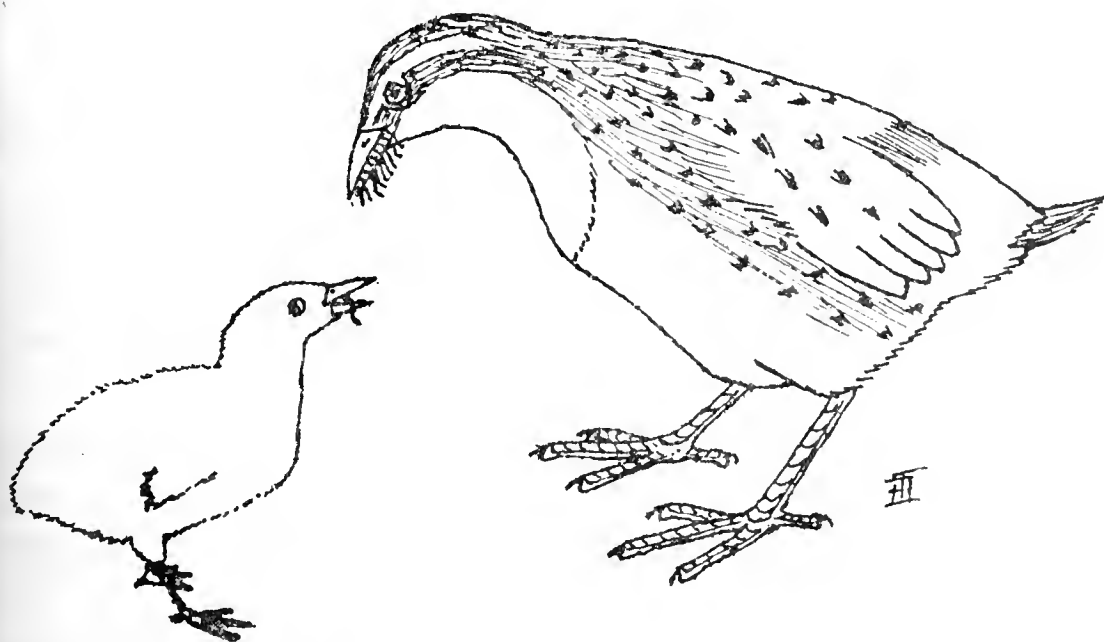


Fig. E. "Feeding Chick"—mealworms held in beak.

ken up. I understand that on Macquarie Island where Wekas were introduced as food for sealers and whalers, the topsoil in areas has been lost by erosion through the persistent probing of Wekas hunting for earthworms. Witnessing the damage done to our turf in the flight, I can easily visualise the problem on Macquarie Island.

Besides live food, we feed hard boiled egg, minced meat, chopped pears, pears and apples, ripe elderberries being hung from various shrubs when in Season. An occasional pinch of calcium phosphate and a few drops of multivitamin are added to the egg and meat. Reading that Wekas also eat snails, I presented them with about three dozen garden snails (*Helix aspersa*) 4 cm. wide and about 3.7 cm. high, which I

had collected from the Cotswolds. These were scattered over a wide area of the flight and after a few minutes the male found a snail and examined it by turning it over and picking it up with his beak. Several times he banged the snail on the soft ground and eventually carried it to an outcrop of sandstone and hit the snail on the solid surface several times before it broke into pieces. The snail was swallowed without sub-dividing.

The male found a hairy caterpillar about $1\frac{3}{4}$ in. long and took it to a bare sandy patch and rubbed it vigorously back and forth in the sand and soil for several seconds. He then fed it to one of the chicks, which swallowed it after some hesitation. After the chick had swallowed the caterpillar, it spent several minutes cleaning its beak on a tuft of grass by rubbing one side and then the other. I got the impression that the food was not enjoyed at all.

During the next few days, most of the snails had been brought to the "anvil" and smashed. On two other occasions, I observed the male inserting snails into a crevice on a tree trunk and then proceeding to hammer them until they broke into fragments.

I purchased three North Italian Wall Lizards (*Lacerta sicula campestris*) about 20 cm. long, and released all three into the flight in order to observe their reaction to this unusual type of food. The male chased one of the lizards as soon as it was released and caught it by the tail, only to be left with a piece of violently wriggling tail in its beak, while the lizard scuttled away to safety under some sandstone. The tail was eaten after a little investigation.

The two chicks continued to thrive and at four weeks had lost most of the fluffy blackish down and began to look like the adults, with the exception of the legs, which were reddish instead of brown, the grey beak patches being much paler.

At seven weeks, they appeared almost independent; only very occasionally would one see any feeding by the parents and this tended to be new birds or mice or large locusts which had to be pulled into suitable pieces, in order to swallow them. This is done by a tug-of-war method, the adult on one end and the chick on the other, pulling until something gives way. Quite often the chick fell over backwards as the food item broke in two.

After the chicks had left the nest, two more nests were built, one in a second cave and the other under an evergreen shrub. These nests were used during extremes of weather, the nest under the shrub being used by the parent bird and chicks during very hot spells and the cave during wet and cold weather. I found the use of these nests very amusing, because the two chicks by this time were quite large and had great difficulty in trying to get under the adult because of their size and had to be content with huddling together, one under each wing of the parent.

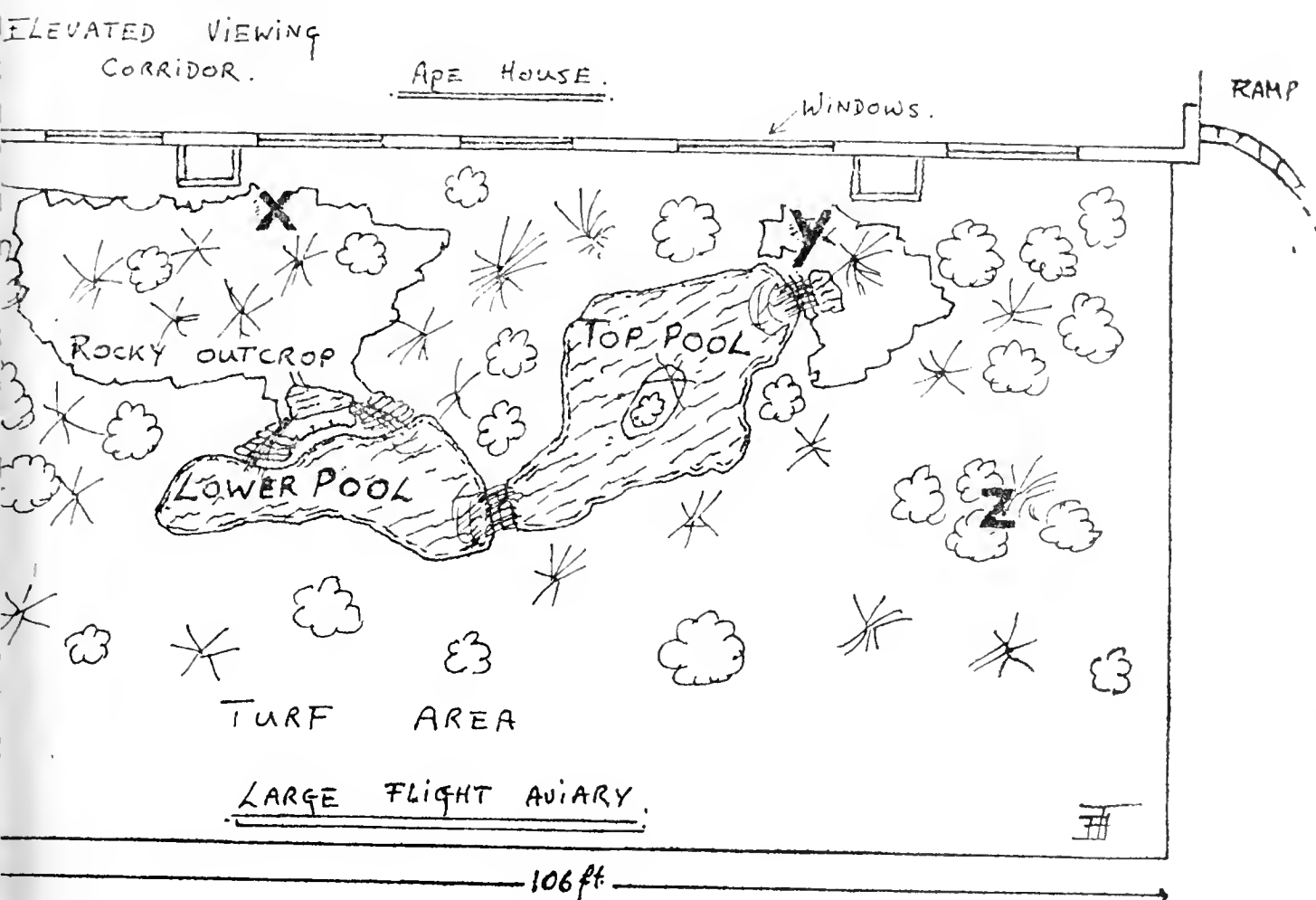


Fig. F.

- X = Nest where incubation and greater part of rearing took place.
 Y = Nest used in cold weather.
 Z = Nest used in warm weather.

VOICE

The Weka has quite a range of calls, many of which are loud and loud, but they are very difficult to put into words. I have listed the various sounds as they appeared to me during the time spent observing these very remarkable birds.

Territory Call: A loud booming Kuck-kuck-kuck.

Alarm Call: The bird stretches its neck upwards and emits a low coo-et, coo-et, coo-et.

Displaying Call: (Both sexes) Kloo-Kloo-tick-tick.

Chase Call: Used when one bird is chasing another from the territory. Wee-wee-ee-eeek.

Threatening Call: (Used by both sexes) With neck upwards and body feathers erect, a loud gook-gook-gook. This is usually followed by a thrust at the intruder with the beak.

Alarm Call: A soft murmuring Kuck-kuck-kuck, followed by tewk-tewk, repeated every two or three seconds ending with hard groans and ticks.

Alarm Note: A thin, fairly high-pitched wee-eeek, wee-ee-eeek, wee-ee-eeek; this call can be heard for a considerable distance.

Chicks Call: A soft tick-tick-tick and a harsh jik-jik-jik, mainly connected with feeding, also a very low whistle which I assume to be the anxiety call.

REFERENCES

FALLA, R.A., SIBSON, R.B. and TURBOTT, E.G. (1966). *A Field Guide to the Birds of New Zealand* (Collins).

ACKNOWLEDGEMENTS

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* * *

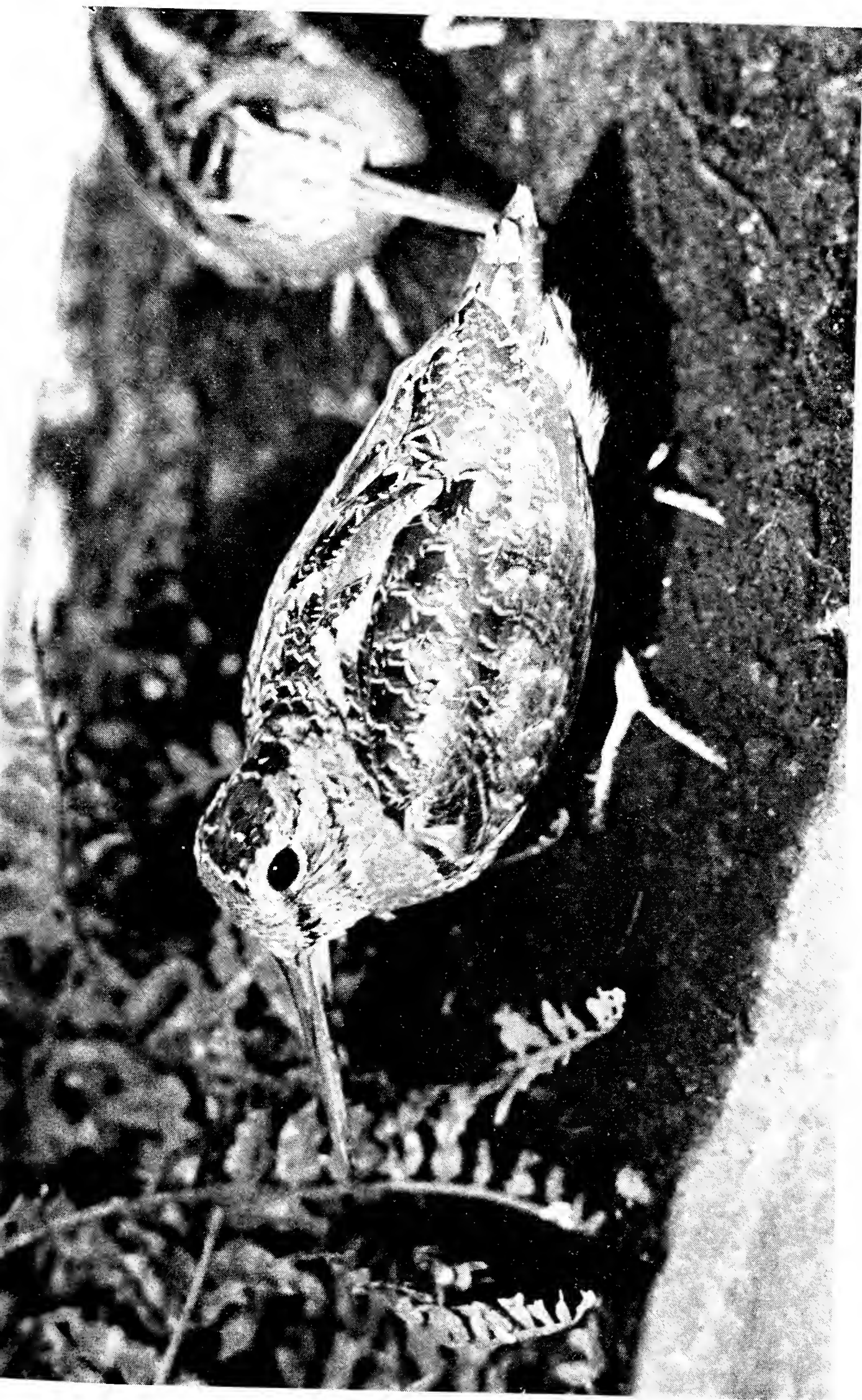
THE CARE AND EXHIBITION OF AMERICAN WOODCOCKS AT THE CINCINNATI ZOOLOGICAL SOCIETY

By C. JERRY WALLACE (Cincinnati, Ohio, U.S.A.)

In April of 1971 Mr. Ronald Austing, a well known U.S. student birds and naturalist photographer, discovered the nest of an American Woodcock (*Philohela minor*) of which he proceeded to do a photographic study. The hen soon abandoned the four chicks and Mr. Austing undertook the job of hand raising them. He enlisted the help of the Zoological Society of Cincinnati in supplying earth worms for the chicks' tremendous appetites.

On 18th May 1971 the chicks were presented to the Zoological Society of Cincinnati. Director Edward Maruska and Head Keeper of the bird house Vernon Oswald decided on a cage perfectly suited for the new birds. The cage picked was a newly decorated one which was lined completely with fibreglass for waterproofing and ease of cleaning. The cage measures six feet wide, five feet deep and eight feet high. A simulated stream runs the width of the cage. The foreground up to the glass viewing area is covered with two inches of moist sand. Behind the stream to the rear of the cage a slope is covered with four inch deep sifted earth. A stump and small shrub are added for a more natural effect.

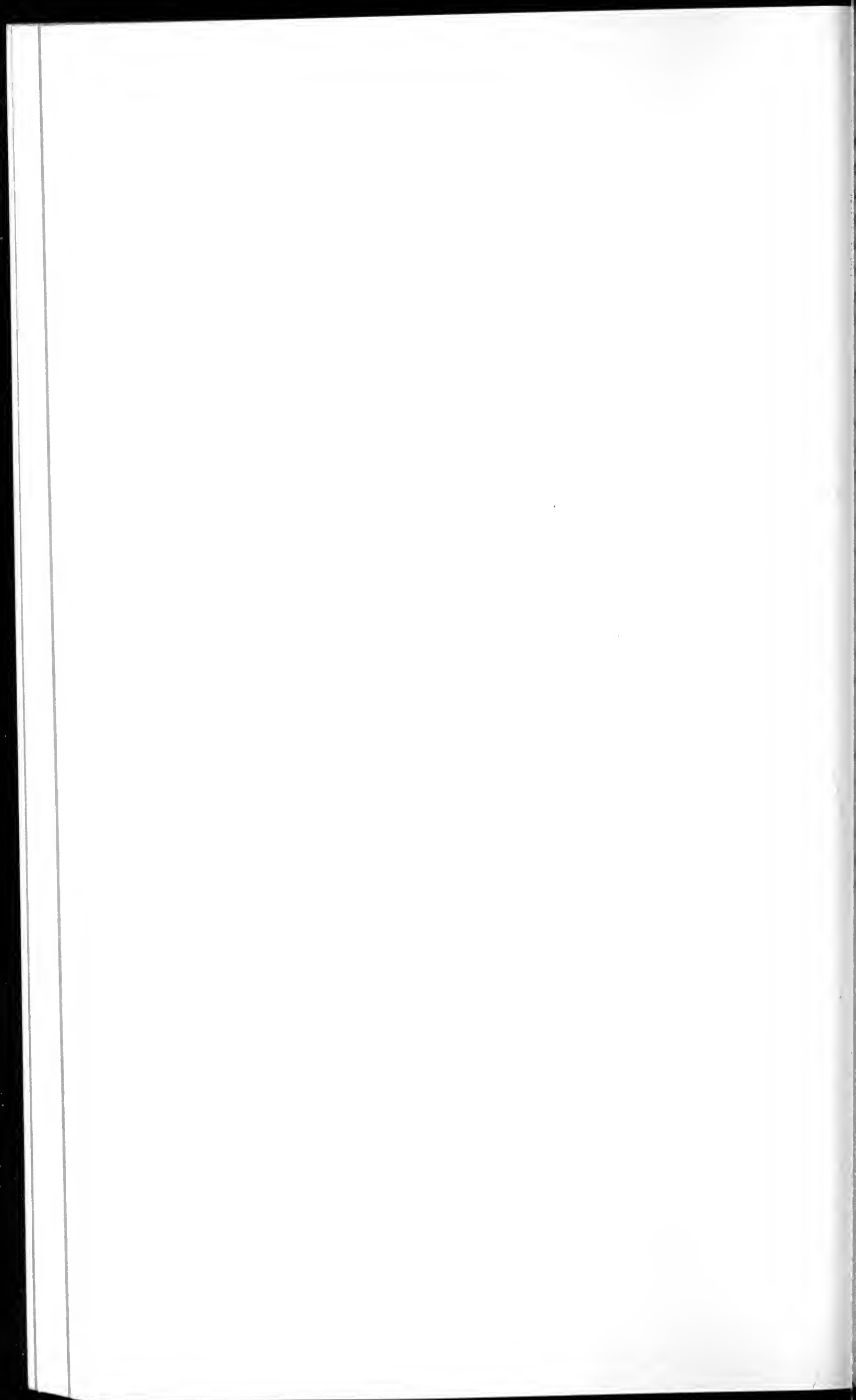
The woodcocks were soon introduced to the new area and adjusted to it extremely well. Our only concern was the huge amount of earth



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American Woodcock on display at Cincinnati Zoo

[C. J. Wallace



rms that would be needed, so a program to condition the birds to
ound meat was started. The young birds accepted the meat without
y hesitation and now eagerly seek it out. A diet of four oz. ground
se meat with vitamins and minerals, moistened with water is fed
ly at 8 a.m. along with a handful of earthworms occasionally laced
h meal worms. At 12.30 p.m. the morning meat dish is removed
a fresh one replaces it. At present the young birds are thriving on
s regimen.

The woodcocks have become most calm and are not bothered in the
st by the daily cage cleaning, twice daily feeding or the viewing public.
The stream and bedding in the cage make it a most attractive display
h for the public and the birds. To see the birds probing into the
th and moist sand for the worms in their natural manner is most
sfying.

The Cincinnati Zoo's constant effort to place compatible animals of
erent types together for the benefit of both animal and public, led to
introduction of a pair of Eastern Bluebirds (*Sialia sialis*) to the exhibit.
s mixing had the effect of making both types of birds much more
n and the added natural effect makes it a most intriguing display.
The young birds, three female and one male, have not presented us
n any problems whatsoever. (Dimorphism has been determined by
eral body size and bill length.) All are very healthy and eating well.
o records can be found for these birds being successfully maintained
an artificial environment. Several attempts to keep them have
n tried both at our own zoo and others but all have failed within
ks. The seven months they have been with us appears to be a record.
he viewing public has found the woodcocks a most fascinating exhibit
comments constantly about it. Here is a good example of the
lay of a little seen but common bird being fascinating and most of all
rmative to visitors to institutions such as ours.

* * *

NEWS FROM THE BERLIN ZOO

By PROF. DR. HEINZ-GEORG KLÖS

We have been very pleased with our Flamingo colony which has already been breeding since 1963 on a muddy island in one of our lakes. Apart from a European Flamingo (*Phoenicopterus ruber roseus*), six Chilean Flamingos (*Phoenicopterus chilensis*) have been brought up in 1971. We do hope that these fine successes in breeding will continue, for even now successful breeding results of Flamingos are not a matter of course in zoological gardens.

To be specially mentioned among the great number of gallinaceous birds, which almost without exception have been hatched in the incubator are five Ocellated Turkeys (*Agriocharis ocellata*), one Great Argus (*Argusianus argus*), 11 *Gemmaeus l. leucomelanus* as well as one Vieillot's Crested Fireback (*Lophura ignita rufa*). In the Tanager-aviary opposite the main entrance of the Bird House our pair of Crowned Wood Partridge (*Rollulus roulroul*) hatched two charming young only the size of a thumb. They were cared for and guided carefully, yet to our regret they were not brought up.

After a long interval, in the little open-air enclosure near the sea lion exhibit, two Peruvian Penguins (*Spheniscus humboldti*) were again hatched but—we are sorry to say—died a short time later. A similar fate happened to an American White Pelican (*Pelecanus erythrorhynchus*) incubated in June in the Pheasantry: the bird had not drawn in the bag of yolk completely and died after four days.

Worth mentioning are also the rearing of two Black-billed Whistling Ducks (*Dendrocygna arborea*), two Gadwall (*Anas s. strepera*) and two Moluccan or Black-Backed Radjah Shelducks (*Tadorna radjah*). With these species breed only rarely in zoological gardens. With the 'delicate' species the Andean Crested Duck (*Lophonetta specularioides alticola*) may be included and three young have been hatched by their parents, but did not survive. Two young Black Swans (*Cygnus atricolor*) and three Black-necked Swans (*Cygnus melanocoryphus*) were reared successfully.

The breeding successes in birds of prey and owls were remarkable. We intend to introduce the young female of the Andean Condor (*Vultur gryphus*) mentioned in our last news, to the male which hatched in 1970.

Unnoticed by the keeper and visitors this year the Crested Caracara (*Polyborus plancus*) began breeding for the first time. In June the female had appeared very aggressive towards the other inhabitants of the aviary but further particulars had not been observed. Looking back, this probably to be an advantage for perhaps the birds would have resented control of the nest and would have been disturbed in breeding. As it was, the rearing of one young bird succeeded without any difficulties. Toward

At the end of the year it is distinguishable from its parents only by a somewhat lighter colour of the plumage. Whether other zoos have been successful in breeding these representatives of the South American Caracaras, we do not yet know. All Caracaras live in open terrain, especially in steppes and on coasts. Their long legs portend that they live a great deal on the ground, where they look for carcasses. The range of this group of birds extends from the South of the U.S.A. to Tierra del Fuego.

For years we have kept a male Common Buzzard (*Buteo b. buteo*) with a female Red-tailed Hawk (*Buteo jamaicensis borealis*). The female laid an egg on 11th May 1971, and hatched a young which at first was well cared for but after a few days suddenly vanished. We presume that it was taken by the parents.

Our three young European Eagle-Owls (*Bubo bubo*) have been given to the Braunschweig bird-sanctuary which is endeavouring to re-establish its largest native owl in the Harz.

Unfortunately, the King Vulture (*Sarcorhamphus papa*), the Black Vulture (*Aegypius monachus*), White-headed Vulture (*Trigonoceps occipitalis*), and Griffon Vulture (*Gyps fulvus*) had infertile eggs.

* * *

NEWS FROM THE DEPARTMENT OF ORNITHOLOGY AT THE NEW YORK ZOOLOGICAL PARK

By JOSEPH BELL (Associate Curator, Department of Ornithology)

Preparing new bird displays is an exciting project, particularly when they involve the size and scope of the ones in the new Lila Acheson Wallace World of Birds at the Bronx Zoo. Completed by the general contractors early in 1971, all of the Park's exhibition and technical specialists have since been involved in the interior decor of this new facility, creating ponds, waterfalls, rocky cliffs and background paintings. By the year's end, eleven of the twenty-five exhibits were completed, planted and inhabited by birds. The new building is scheduled to open to the public in June, 1972. Among the many birds acquired for the World of Birds exhibits, the following were new to the collection:

Jelsk's Wood Nymph *Thalurania furcata jelskii*
 Bolivian Masked Trogon *Trogon personatus submontanus*
 Bolivian Black-fronted Nunbird *Monasa nigrifrons canescens*
 Burmese Red-rumped Woodpecker *Picus erythropygius nigrigenis*
 Scarlet Manakin *Pipra fasciicauda scarlatina*
 White-plumed Honey-eater *Meliphaga p. pencillata*
 Spiny-cheeked Honey-eater *Anthochaera rufogularis*.

Once again as in 1970, the breeding season was distinguished more by the variety than by the number of species reared. In all, 220 birds of 43 species were raised in 1971. Some of the more noteworthy successes were: one Pileated Heron *Pilherodius pileatus*, a species rarely hatched in captivity; two Wattled Cranes *Burgranus carunculatus*; three White-quilled Black Bustards *Afrotis afra afraoides*; one Tawny Frogmouth *Podargus strigoides*; one Uganda Double-toothed Barbet *Lybius bidentatus aequatorialis* and two Natal Pigmy Kingfisher *Ispidina picta*. A pair of Little Black Rails *Limnecorax flavirostris*, acquired early in 1971 nested four times and reared nine chicks by the year's end.

The greatest disappointments of the season were four Tufted Puffin *Lunda cirrhata*, eggs that failed to hatch and a single North Pacific Murre *Uria aalge inornata*, hatchling that lived just short of one week.

* * *

NEWS AND VIEWS

Dr. Alan Lendon has bred an African Grey Parrot—an uncommon event in captivity anywhere and certainly in Australia.

* * *

An account by K. Bastien of the rearing of three youngsters by his Sharp-tailed Conures (*Aratinga acuticauda acuticauda*) appeared in the recent issue of "Cage and Aviary Birds". It is doubtful whether the species has been bred before in captivity.

* * *

B. C. Sayers writes "My Barn owls have made a major contribution to this year's breeding results. The pair have reared 10 young in three nests (3, 2 and 5), the first egg of the third clutch being laid on 1 September. The same female laid a further clutch of six eggs during the early part of this month (December 1971). However, I removed the eggs and nesting hide in the hopes that she would take a rest, but on 18th December I found that once again she had started to lay and was incubating two eggs on the concrete floor of the aviary. In desperation I returned the nesting hide and today (20th December) she was contentedly incubating three eggs".

* * *

Queen of Bavaria Conures were bred successfully in 1971 not only by Mrs. Howard (as reported in News and Views, November/December 1971) but also by Sir Crawford McCullagh whose pair reared two youngsters.

R. Kyme has again been successful in breeding Weber's Lorrikeet. Two young birds left the nest in September and the adult pair hatched two more chicks in December. The two youngsters reared in the previous year appear to be a pair. Other birds reared in his aviaries in 1971 include two Lutino Ringneck, four Pennant, six Stanley, one Mealy, four New Zealand Yellow-fronted, four yellow and three split yellow redrump and 10 Turquoise Parrakeets.

* * *

Walther Langberg of Copenhagen is well known as a remarkably successful breeder of parrakeets and rare finches. Among the species reared in his aviaries in 1971 are King, Crimsonwinged, Pileated, Rock Peplar, Pennant, Princess of Wales, Many-coloured, New Zealand Yellow-fronted, Derbyan, Elegant and Bluewinged Parrakeets and, perhaps even more noteworthy, Blue Alexandrine Parrots and Spectacled Parrotlets.

* * *

G. A. Smith's pair of Pallid Caiques produced another single chick on 14th December.

* * *

From the Hobart "Mercury" 13th March 1971: "Four sightings of the little known Ground Parrot were made by an observer walking in Tasmania's South-West early in March. There are not many of these parrots and they have a large slice of country over which to roam. They do not move in flocks but in pairs. They nest on the ground under a bush clump of grass and are never found perching in trees. Ground parrots are handsome birds. Their bodies are bright green flecked with dark brown and gold. They have a red patch on the forehead and a bright gold and green tail. Although they occur in coastal districts in Queensland, New South Wales, Victoria and South Australia, Tasmania is their stronghold".

* * *

If I were compelled to keep only one pair of birds I should have no hesitation in selecting the species. I should choose a pair of Splendid Grass Parrakeets which nature has endowed with all the beauty, charm and other requirements of the ideal aviary bird. For those who find its combination of blues, scarlet, green and yellow too garish there is a blue variation in which the green is replaced by blue, the scarlet by a pale pinkish apricot and the yellow by cream or white. In some males the

blue is particularly intense and the entire chest, breast and abdomen are white giving them the appearance of a Psittacine equivalent of the Japanese Blue Flycatcher. This exquisite mutation is gradually being established in some British aviaries, it is rumoured that there are a few specimens in Holland but, apparently, it has almost died out in Australia where it originated about 10 years ago.

* * *

The Frankfurt Zoo was successful in 1966 in breeding the White-necked Bald Crow (*Picathartes gymnocephalus*) for the first time in captivity. In 1971 it succeeded with another member of the genus *Picathartes*, the Cameroon Bar-headed Rock Fowl (*P. oreas*) of which four specimens were reared. Also bred in the zoo last year were 10 Ocellated Turkeys, one Sheepmaker's Crowned Pigeon and two Pigmy Kingfishers.

* * *

During the past few months several specimens of the "Island" King Parrakeets (*Alisterus amboiniensis*) have been imported. These are different from the other members of the genus *Alisterus* in being much darker red and green and, more remarkably, in that the males are almost identical with the females. They inhabit Northern New Guinea, the Moluccas and the Celebes and several subspecies are recognized which differ mainly in the extent of blue on the back. The nominate race (*Alisterus amboiniensis amboiniensis*) from Ceram and Amboina has on the mantle bright blue, the Salawati race (*A. a dorsalis*) has the entire back and rump blue and the subspecies from Halmahera (*A. a hypophoniensis*) has blue wings as well. The late Ted Vane, whom many aviculturists remember as *the* authority on parrots, possessed a hen Salawati King Parrakeet which never bred but which killed two Australian King males in quick succession. The Duke of Bedford described them as "fierce birds addicted to murder" but he succeeded in breeding hybrids from a female of the Sula Island race (*A. a. sulaensis*) and a male Crimson-winged Parrakeet. According to Vane the species has been bred in captivity "once in 1940, when no observations were recorded". Both the nominate race and the Salawati subspecies have been offered for sale recently and have been snapped up at enormous prices. Unfortunately like so many Parrots handled by dealers, some have been too diseased to survive but others appear to have been established successfully. Some successful breedings might justify the removal of these majestic creatures from their island habitat.

* * *

It is almost 25 years since a short article which I wrote on the birds of New Zealand was published in the AVICULTURAL MAGAZINE. During the year I lived in that lovely country I spent much of my spare time in places where the native bush had escaped destruction and where it was still possible to see many of the delightful species of birds like the Bell-bird and Tui which are found only in New Zealand. But I was very disappointed by the Government's attitude to aviculturists for, at that time, it was illegal to keep any species of New Zealand bird in captivity. However, in the last decade or so the N.Z. Government, which has been conservation conscious for a long time, has begun to recognize the part that aviculture may play in helping to conserve rare species. Licensing aviculturists to keep the attractive Yellow-fronted and Red-fronted Parrakeets (*Cyanoramphus auriceps* and *C. novae-zeelandiae*) was a start and it was not long before both species were being bred in very large numbers in aviaries all over the country. In 1961, the Wildlife Branch of the Department of Internal Affairs established the Mount Bruce Native Bird Reserve to provide facilities for the holding and breeding in captivity of endangered species. I spent an enjoyable and interesting day there just over a year ago and was very impressed by the strides that are being made. Both the Blue Duck and the Brown Duck were breeding well as also was the very rare Eastern Weka. A range of aviaries had been constructed which houses pairs of uncommon passerine species including Stitch birds and Saddlebacks. The Saddleback (*Creadion arunculatus*) is closely related to the probably extinct Huia and like it has orange wattles on its cheeks. It is about the size of a Mistle Thrush. The "saddle" is a patch of bright orange-red across the back and wings while the rest of the plumage is glossy black. I had never before seen living examples of this beautiful species and I was surprised and delighted to learn that it was being successfully bred in the Reserve. If the Curator is still a member of this Society (he was at the time of my visit judging by the prominence of a row of AVICULTURAL MAGAZINES on the bookshelves in his office!) perhaps he would let us have some information on the interesting and important collection in his care.

* * *

A. A. Prestwich contributed News and Views to this magazine for more than 20 years and the Society is indebted to him for his efforts always to inform and sometimes to amuse its members. News and Views has been a popular feature of the Magazine for so long that it is considered that every attempt should be made to keep it going. Members are urged to send any items of avicultural interest for inclusion in this section to Professor J. R. Hodges, Craignair, Cuckoo Hill, Pinner, Middlesex.

J. R. H.

NOTICE

REQUEST FOR INFORMATION REGARDING ANY PREVIOUS RECORD OF BREEDING JERDON'S STARLING.

In the January-February number 1972 (page 11) the breeding of Jerdon's Starling (*Sturnus burmanicus*) was described by Raymond Franklin.

It is believed that this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

XVI INTERNATIONAL ORNITHOLOGICAL CONGRESS

The International Ornithological Committee agreed at the end of the XV International Ornithological Congress in the Hague, Netherlands, that the next Congress would be held in Australia in 1974. Professor J. Dorst was appointed President. The Australian initiation had been proffered jointly by the Royal Australasian Ornithologists' Union and the Australian Academy of Science.

The Royal Australasian Ornithologists' Union appointed Dr. H. J. Frith as Secretary-General and an Australian Advisory Committee has been formed. After close examination of the possibilities the Australian Advisory Committee has decided that the XVI International Ornithological Congress should be held in the Australian National University in Canberra in the period 12th August to 17th August 1974. A programme of scientific sessions, major and minor excursions and ornithological exhibits will be organized.

Applications for membership will be accepted until 1st March 1974. Applications for the presentation of papers and for arranging Specialist's Meetings should reach the Secretary-General not later than 1st February 1974. It is probable that, apart from those presented by invitation in a Symposium, there will be some selection of the papers that are actually read. Accordingly it is essential that each offer of a paper should be accompanied by a summary of about 200 words.

Information regarding the XVI International Ornithological Congress can be had from:

The Secretary-General,
XVI International Ornithological Congress,
P.O. Box 84, Lyneham. A.C.T.
AUSTRALIA. 2602.

CAROLINA PARRAKEET

Reference to any work on vanishing or extinct species shows that the last known Carolina Parakeet *Comuropsis carolinensis carolinensis* in captivity died in the Cincinnati Zoo, in 1914: some authors have even given the date as 1st September, apparently confusing that of the death of the last Passenger Pigeon *Ectopistes migratorius* which also died in the Cincinnati Zoo.

In 1973 the Cincinnati Zoological Gardens celebrates its centenary and in connection with this event the eminent American bird artist John A. Ruthven proposed making a painting of the Carolina Parakeet, using the last captive survivor as a model. But where was the skin? To George Laycock fell the task of locating it. Easy enough one would have thought but, unfortunately, there are no records of so early a date in existence at the Cincinnati Zoo. George Laycock has described his very extensive search, in some detail, in *Audubon*, 1969, March, 21-25, with a colour plate by John A. Ruthven. The account has been reproduced in *South Carolina Wildlife*, Summer, 1969; *American Cage-Bird Magazine*, 1970, December, 39-40; 1971, January, 29-30; February, 34-36; and in part in *Foreign Birds* (F.B.L.), 1971, May-June, 102-108. The skin was not found but George Laycock unearthed a very illuminating item, in the *Cincinnati Times-Star*, Friday, February 2nd, 1918. It is of sufficient interest to warrant reproduction in these pages:

Far-famed Last Parakeet of its Kind is Mourned at Zoo

COL. STEPHAN, SUPERINTENDENT OF THE GARDEN, BELIEVES THAT
GRIEF WAS A CONTRIBUTING CAUSE—WILL HAVE THE BODY STUFFED.

"A student of bird life, acting as coroner in the case of 'Incas', the Carolina Parakeet, said to be the last of its race, might enter a verdict of 'died of old age'. But General Manager Col. A. Stephan of the Zoo, whose study of birds goes farther than mere physical structure, development and decay knows the bird died of grief. 'Incas', coveted by many zoological gardens, died Thursday night surrounded by his genuinely sorrowing friends, Col. [sic] Stephan and the keepers. Late last summer, 'Lady Jane', the mate of Incas for 32 years, passed away, and after that the ancient survivor was a listless and mournful figure, indeed. In recent years Col. [sic] Stephan received many large offers for Incas and Lady Jane and the New York Zoo was especially eager to obtain the birds. After the death of the male, various zoos renewed offers for the survivor, but Col. [sic] Stephan would not part with the bird. Just how old the parakeet was is not known. The bird was well-aged when it, with its mate, was obtained by the Zoo 32 years ago.

"The Carolina parakeet family was the only real American parrot", said Colonel Stephan, Friday. 'There was a time when the family was a numerous one. But a curious trait in the make-up of the family proved its undoing. The parakeets would fly in thick flocks and, if a hunter fired into them, they would wheel and come right back to the scene of the shooting as if curious to see what caused the explosion and to learn why some of their number fell to the ground. So by their foolishness the Carolina parakeets gradually were shot out of existence as a family'.

Colonel Stephan will have the bird mounted and, in accordance with a promise made by him some years ago, will present the specimen to the Smithsonian Institution."

The skin never arrived at the Smithsonian Institution, but it is just possible that it is displayed in the Cincinnati Museum of Natural History, without a data label of any kind.

A. A. PRESTWICH.

AVIARY

Ask almost any aviculturist the meaning of "aviary" and he will probably mumble something about a flight and avis—a bird. Later he may consult a dictionary to check his "definition".

The word is derived from the Latin *Aviarius* used by Cicero (106–43 B.C.) to denote a place where birds were kept, a poultry-yard: and by Virgil (70–19 B.C.) as the resort of wild birds in a forest. Dr. Thomas Fuller (1608–1661), the English antiquarian and divine, had the same meaning in mind when he said that "Lincolnshire may be termed the aviary of England, for the wildfowl therein". Nowadays an aviary is understood to be a large cage, house, or enclosure, in which birds are kept, with the object of studying their habits and, if possible, inducing them to breed successfully under conditions as nearly as practicable approaching those found in Nature.

The *Oxford English Dictionary* cites the first use of the word aviary as: "1577, Harrison, *England* III, ii, 17. Our costlie and curious aviaries". The Superintendent, The British Museum, Department of Printed Books, has taken considerable trouble to trace this reference and kindly writes: "I have not been able to find this reference in the 1577 edition; chapter ii of Book III concerns "our apparell and attire" and it does not occur in either chapters ix or xi which concern "wylde and tame Foules" and "Hawkes and ravenous Foules". It does however occur in the 1587 edition in Book III, chap. ii "Of wild and tame foules", line 48.

The correct bibliographical citation of the work is as follows:

Harrison (William) *The Description and Historie of England*. In: Holinshead (Raphael) *The First Volume of Chronicles*, London, 1587.

William Harrison (1534–1593) topographer and historian, Canon of Windsor also produced an English translation of Hector Boethius's *Description of Scotland* (1577).
A. A. PRESTWICH.

* * *

CORRESPONDENCE

USE OF THE FOOT BY PARROTS WHEN FEEDING

I wish to thank G. A. Smith for his interesting article on the use of the foot by parrots when feeding (*Avic. Mag.*, 77, pp. 93–100, 1971). This well-known behavioural trait is seldom mentioned in the literature, and aviculturists are in good position to obtain information. I would like to comment on some of Mr. Smith's claims and give some information for *Opopsitta*.

Mr. Smith states that the Nestorinae are seldom "prehensile-footed" when feeding, but does concede that Kakas (*Nestor meridionalis*) can hold food in this way. I have photographs from Kapiti Island, New Zealand, showing Kakas feeding and some birds are holding food in a normal "prehensile-footed" position. I believe that with this species "prehensile-footed" feeding is not at all uncommon.

The claim that *Geoffroyus* is "prehensile-footed" does not agree with my observations on wild birds. Birds I have observed feeding made no use whatever of the foot, but Bell (pers. comm.) has observed "tether-footed" feeding.

I have had in captivity for three years a male Red-browed Fig Parrot (*Opopsitta diophthalma macleayana*) and this bird never uses the foot when feeding; I have confirmation of feeding without use of the foot from observations on wild birds in northern Australia and New Guinea.

JOSEPH M. FORSHAW.

14 BLACKMAN CRESCENT,
MACQUARIE, A.C.T. 2614,
AUSTRALIA.

SEXING PARROTS

In the September–October issue of AVICULTURAL MAGAZINE I invited Mr. G. A. Smith to comment further on his suggestion that there is a correlation between sexual dimorphism and the inability to use the foot for feeding in parrots. His explanation in the November–December issue is both ingenious and convincing, and I must both thank him and congratulate him.

On the matter of the relationship between *Amazona xantholora* and *A. albifrons*, I am afraid that Mr. Smith is on shakier ground. What may or may not happen somewhere when two or more Amazon parrots are sympatric is irrelevant to the consideration of this case. Contrary to Mr. Smith's statement, *A. xantholora* and *A. albifrons* have indeed evolved differences in habitat preference in their area of sympatry, although there is overlap. Paynter ("The ornithogeography of the Yucatán Peninsula", Peabody Mus. Nat. Hist. Yale Univ. Bull. 9, 1955: 125) states: "It appears . . . that *A. xantholora* is more abundant in the deciduous forest, and *A. albifrons* in the rain forest. Although at times both species may occur in the same general area, I have never found them associated in a single flock (nor did Paynter know of any other worker who had, but a mixed flock has subsequently been reported at least once), and always one species is more abundant than the other, depending on the nature of the habitat." This evidence certainly strongly suggests a partial ecological separation. The occasional formation of mixed flocks (Klaas, Univ. Kansas Publ., Mus. Nat. Hist., 17, 1968: 591) argues for, not against species status.

Mr. Smith suggests that these two Amazons resemble such well-known cases as the Carrion and Hooded Crows *Corvus c. corone* and *C. c. cornix* which form a hybrid zone". This is precisely the kind of case that the Amazons do *not* resemble, as none of the many collectors that have worked on the Yucatán Peninsula has ever, to my knowledge, taken an intermediate specimen. Further, both of the crows have extensive ranges of their own, whereas the range of *Amazona xantholora* is almost entirely encompassed by that of *A. albifrons* (the exceptions being Isla Cozumel and probably the drier portions of the deciduous forest that dominates the northern part of the peninsula). There is no doubt that the two are closely related, and *A. xantholora* probably is *derived* from a once-isolated population of *A. albifrons*, but they must now be considered sibling species rather than con-species. I think a better comparison than the crows from the European avifauna would be the Red Crossbill *Loxia curvirostra* and the Parrot Crossbill *pytyopsittacus*. The breeding range of the latter is encompassed by that of the former; there is a habitat preference but it is not complete; mixed flocks may occur outside the breeding season but both species usually occur in pure flocks; and there is little doubt that, although now acting as a good species, the Parrot Crossbill must have evolved from a population of the Red Crossbill.

It is an amusing afterthought that I had already selected the example from the genus *Loxia* before I realized the coincidence in comparing *Amazona xantholora* with the Parrot Crossbill!

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NEW MEMBERS

The twelve Candidates for Membership in the January-February 1972 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

CANDIDATES FOR MEMBERSHIP

A. ALLEN JR., 1155, East 4780, South Salt Lake City, Utah, 84117, U.S.A. Proposed by N. H. Hagerdon.

VE BACKMAN, Fr. Nansens väg 28, S-451 00 Uddevalla, Sweden. Proposed by T. Brosset.

ORSTEN BERGLIND, Tuvängsvägen 3, S-752 45, Uppsala, Sweden. Proposed by T. Brosset.

TER BETTS, 115, Nalders Road, Chesham, Bucks. Proposed by R. Franklin.

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L. MAUGHAM, Cottage on the Hill, Stansted, Near Wrotham, Kent. Proposed by Prof. J. R. Hodges.

SLIE A. RANCE, Arizona, Northchurch Common, Berkhamsted. Proposed by R. Franklin.

RRIE R. THOMAS, 14, Green Lane, Rainford, Lancashire. Proposed by A. J. Mobbs.

OF. DR. ERHARD THOMAS, Institut für Physiologische Zoologie, University, D-65, Mainz, Sgrstr. 21.

H. TORKINGTON, County Police Station, Ruskington, Sleaford, Lincolnshire. Proposed by R. Kyme.

NRI F. WITHINGTON, Route 1-Box 92-B, Broken Arrow, Oklahoma, 74012, U.S.A. Proposed by C. D. Wilson.

CHANGES OF ADDRESS

DR. J. P. ANDRE, to 27bis, Rue de 14 Juillet, 33-La Teste-de-Buch, France.
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 F. H. CHARNLEY, to Barwythe Hall, Studham, Bedfordshire.
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 ELDON RADTKE, to P.O. Box 271, Peru, Illinois, 61345, U.S.A.
 FRANK REITZ, to Cleethorpes Marineland & Zoo, North Sea Lane, Humberstone,
 Grimsby, Lincolnshire.

Please note the following omissions from or corrections to the Member's List
 published on 1st November 1971.

OMISSIONS

Dr. W. WINKEL, Institut fur Vogelforschung, "Vogelwarte Helgoland", 2940
 Wilhelmshaven-Rustersiel, West Germany.
 MAJOR STILWELL, O.B.E., M.C., 122 Rua S, Sebastiao Da, Pedreira, Lisbon, Portugal.
 BENT PENDERSON, Magnoliavej 4, 4700, Nestveo, Denmark.

CORRECTIONS

W. R. HAWKES, Cuirawong, Salt Creek, South Australia (Life Member).
 K. E. LAURENCE, M.Sc., Ph.D., M.B.O.U. "U" not "W" in Laurence.
 DANAI SNID-VONGS, M.D., N.P.H. (Life Member).
 G. C. WOOD, not "Woods".

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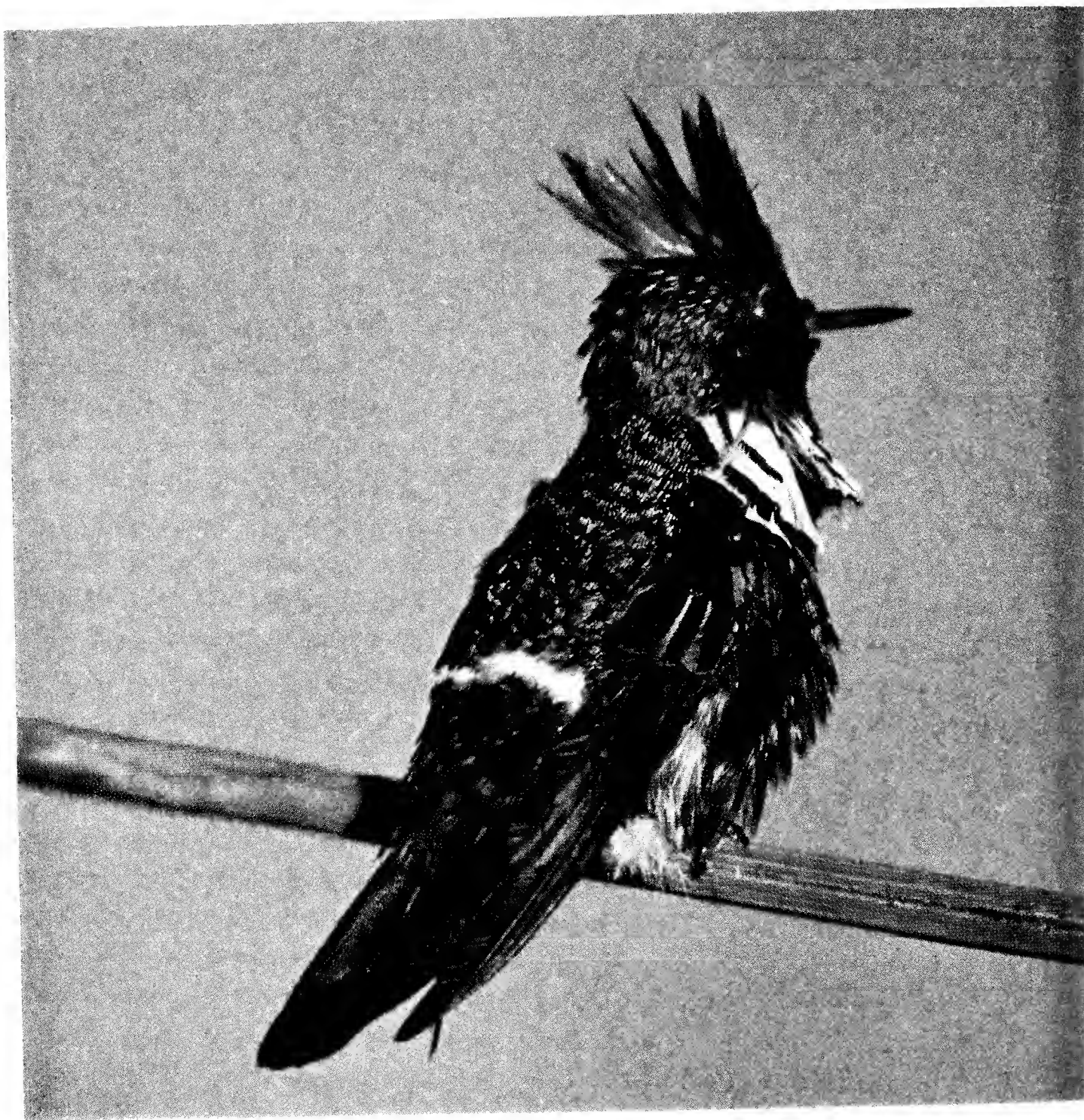
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[A. J. Mob.

Colour photograph of Frilled Coquette Hummingbird, with
crest fully erect
(more than double life-size)

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MAY-JUNE 1972

NOTES ON THE FRILLED COQUETTE HUMMING BIRD

By A. J. MOBBS (Walsall, Staffordshire, England)

All members of the genus *Lophornis* are very beautiful, although some may perhaps, be considered a little bizarre due to their highly ornamental tailfeathering. It is rare indeed for any to reach Britain and the only species I have owned so far is the Frilled Coquette, *L. magnifica*.

I purchased a male in September, 1968. At first this bird was housed in a large flight cage together with a male Wire-crested Thorntail, *Opelairia popelairii*, and a male Raquet-tailed Coquette, *Discosura nigicauda*. All lived together amicably until the first moult had been completed, when the Thorntail although not actually becoming aggressive, did worry the Frilled somewhat by continually displaying to him. Because of this, I decided to house the Frilled on its own and I transferred it to a cage 48 in. by 16 in. by 16 in. To allow plenty of flying space, the cage was only furnished with two perches, one at each end, and a small saucer (I use those taken from a coffee set for really tiny hummers) of water which was placed on a 1 lb jam jar near the centre of the cage.

I have had this Coquette nearly 3½ years at the time of writing and it is only during the last couple of months or so that I have seen it actually venture far enough into the saucer of water to take a proper bath. Up until then, it had only sat on the edge and dipped its head into the water, then turned around and dipped its tail in. Because of this reluctance to bathe, I have always sprayed the Coquette at least once a week, usually prior to cleaning the cage out.

This reluctance to bathe in captivity is not common to the species, as two Coquettes I purchased a few months ago, took to the saucers at once and both have taken a proper bath at least once a day since I have owned them.

The Frilled started its first moult in captivity during February, 1969; it took 15 weeks to complete. As the bird was in poor feather at the time of purchase, I had allowed it to feed from a perch. As soon as it had completed the moult, however, I moved the nectar tube to the centre

of the cage and the bird was forced to hover for its food. Subsequent moults have not taken quite so long to complete as the first and they have presented no problems whatsoever.

This species seems to have no song, in fact the only sounds I have heard my Coquette make is a weak "twitting" note uttered occasionally when on the wing and a high pitched whining note, used only when the bird is disturbed at night. This "whine" is not peculiar to the Frilled Coquette as I have heard a number of the smaller species of hummingbird use it when disturbed at night.

The Frilled does not appear to be highly insectivorous. My bird does take perhaps twenty fruit-flies each day, but compared to many species this is relatively few. The Coquette does not hawk these flies, but prefers to pick them from a surface, tossing them into the air and swallowing them with gaping beak, all in one deft movement. A characteristic of this species, is the tail-wagging which is kept up continuously while the bird is in flight.

The display of this species is quite remarkable. The tail is fanned and held forward under the body; the crest is also fanned and brought forward; the frills are extended to their utmost. The bird then commences to display by moving its body up and down very rapidly. The display is terminated by the bird moving its body from side to side, again very rapidly. During the final movements, the bird's body moves so fast it is difficult for the eye to follow and it always amazes me that the bird is able to remain airborne. Perhaps I should emphasize it is the body of the bird which moves, the head being held directly in front of the object of display throughout the procedure.

I believe this species includes aerobatics as part of its display in the wild. In the confines of a cage, it is of course, impossible for my bird to attempt these. When in breeding condition, my Coquette displays many times throughout the day. Mostly the display is directed at the feeding tube, probably because of the red lip.

The outstanding features of the male Frilled Coquette are the fanned frills on each side of the neck, which are white tipped with a crescent-shaped bar of glittering green, and the erectile crest which is rich chestnut, as is the tail. Throat and forehead are glittering emerald green. As with *Lophornis*, there is a conspicuous band across the rump, which in this species is white.

Very little space is given over to the descriptions of female hummingbirds in the books I have read and it is rare to find an illustration of a female other than some of the very old works. As most *Lophornis* females seem to be very much alike, except for their different coloured rump bands and beaks, it has been impossible to identify correctly the female Coquettes I have seen, if indeed they were actually females and not immature males. A few months ago, I purchased two more Coquettes but until I have moulted them both out, it is impossible to tell whether

They are females or immature males. To hazard a guess, I would say they are possibly one of each, as one has shining green feathers on the upper parts and also a number of shining green feathers dotted about the throat, whereas the other bird has a dull rufous coloured throat and the feathers on the upper parts have no shine to them.

Compared to other families of birds, very little is written about the hummingbirds and it would be of great help to enthusiasts like myself, if aviculturists who have moulted immature birds into adult plumage, could summarise their findings and submit them to the editor for publication.

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EL "VACA DEL MONTE"

By FRANK S. TODD, (Curator of Birds, Los Angeles Zoo)
 N. B. GALE, ((DVM), Director, Summit Zoo, Panama)
 J. R. VAN OOSTEN, (Director, Seattle Zoo, Washington)

Though formerly treated as subspecies, the three forms of umbrellabirds are now regarded by many ornithologists as distinct species. The red-necked umbrellabird (*Cephalopterus glabricollis*) is restricted to Costa Rica and northwestern Panama while the other two species enjoy much larger ranges in South America. The ornate or Amazonian umbrellabird (*C. ornatus*) inhabits the tropical zone of British Guiana, Venezuela, eastern Colombia, Ecuador and Peru, northern Bolivia and Brazil north of the Amazon, whereas the long-wattled umbrellabird (*C. penduliger*) ranges through tropical and subtropical Colombia and Ecuador west of the Andes.

The first umbrellabird known to science was collected in the Amazon basin between 1783 and 1793, but it was not until 1809 that it was described by Geoffrey Saint-Hilaire. To this day, over 150 years later, the natural history of these intriguing cotingas is obscure.

Umbrellabirds are extremely heavily muscled birds with very large, powerful grasping feet. Their grasp is strong enough to break the skin. They are not at all reluctant to bite and often snap their bills shut with a click. They lack the bright, gaudy coloration of many of the cotingas, but their fancy adornments more than compensates for this. These birds are named for their prominent crest that covers the head, somewhat like an umbrella. The crest of *C. ornatus*, the most developed of the three, may measure over 5 cm. in length. It is very thick, divided hair-like at the ends and curves laterally. The bird possesses considerable muscular control over the crest and can position it according to its mood. During courtship the crest is thrown forward whereas it is usually pressed to the rear during flight. The wattle also is usually held

close to the breast when the bird is flying. All three species resemble a large crow both in size and colour.

The three forms are relatively easy to distinguish from one another. Costa Rican birds (*C. glabricollis*) are noted for their conspicuous bare necks and throats. The wattle is least developed in this species and is bare, except for a small area at the distal end of the appendage. During the breeding season the bare throat becomes deep scarlet. The males are able to distend it considerably. The eyes of both sexes are dark, the plumage of the females is more grey than black.

The wattle of *C. ornatus* is relatively flat and measures 8 cm. on the males and a mere 2 cm. on the females. The feathers covering the wattle may extend down an additional 7 cm. The skin around the throat and wattle is scantily feathered, bare in places and very dark. In contrast to *C. glabricollis* and *C. penduliger* the iris of both sexes is whitish-grey to whitish-blue. The plumage is deep black with a metallic blue tint on the outer margins of the feathers. The beak is strong. It is black on the dorsum and blue-grey on the ventral surface. The legs are black. The crest feathers have conspicuous white shafts. When courting, the male spreads its crest and extends it outward and forward. When totally extended, the crest obscures the beak and inhibits frontal vision.

The wattle reaches its greatest development in *C. penduliger* where it reaches a length of 35 cm. in adult males. Females and immature males have much less conspicuous wattles. The senior author has noted that adult males have great muscular control over the wattle and can lengthen or shorten it with ease. The underwing coloration of both sexes is mottled white. Females of all three species are slightly smaller than males.

The Los Angeles Zoo has successfully maintained three pairs of long-wattled umbrellabirds for four and a half years. Upon arrival, they were extremely thin, with the sternum plainly visible. One of our first major obstacles was to overcome their reluctance to eat, and most were force fed for a period of time. In this respect we have seen that young birds adapt more rapidly than the adults.

In January, 1969 the senior author travelled to Ecuador to familiarize himself with the habits and habitat of these marvellous birds. The area selected was approximately 75 kilometres from Guayaquil and consisted mainly of primary growth with large, tall trees. However, due to increasing agricultural activity in the area, much of the habitat has been destroyed. The site was 1500 to 2000 metres above sea level and is usually covered with low clouds or fog.

The local natives say that umbrellabirds never descend to the ground. Even though they are a highly arboreal species, the literature suggests that occasionally they may forage on the ground. (We have not observed this at any time with captive specimens.) In their natural environment they spend most of their time at the 18 to 20 metre level. Those

find their way in to captivity are caught by the natives with mist nets set approximately 18 metres from the ground. The set may be three nets or 18 metres tall. The birds are very elusive and difficult to net. Indian rappers claim the males usually appear first, followed by one or more females. Most are netted during the early morning or evening hours when feeding activity is greatest. They do, however, feed throughout the day. The Indians also claim they are easier to catch when it is raining as the rain apparently forces them to fly lower and they become less cautious.

Although they are reported to be very rare, this may be due to the elusiveness and shyness of the species. In three days of netting, three adult males were collected and there was evidence of others in the area. Their call is extremely loud and has been described by Cordier (referring to *C. glabricollis*) as the growling of a distant jaguar, to the far-away mooing of cattle. In Ecuador they are referred to by the Indians as "Vaca del Monte" or mountain cattle and in some cases the bull-bird.

Although they are strong fliers, their flight is slow and somewhat clumsy. Helmut Sick indicates he has observed them crossing the Napo River where it was 800 metres wide. As to be expected of a canopy dweller, the wings are relatively broad and short. They move through trees by a series of long springs or interrupted flying jumps. They are very noisy when they move and often they land on thin branches, causing them to sag considerably, rustling loudly.

The exact nesting season of these birds is unknown, but it is probably in the late spring or early summer. Nesting has been reported in both the wet and dry seasons and it is conceivable they nest twice a year. During this time their calling becomes more intense. The trachea is greatly enlarged and a special resonance device has been developed. Very little has been recorded concerning the nesting activity of umbrellabirds, but Sick describes a nest of a loose accumulation of twigs, 12 metres from the ground. The clutch comprised a single egg, long in shape and rather pointed at one end. It measured 56.0×35.8 mm. and was khaki-coloured, with light chocolate and purplish brown spots and lightly stippled with dark brown. There was little gloss. Indian stories indicate they lay two eggs but produce only one chick. The skin of these birds is highly prized by local natives. We saw more than one possessed by Indians. Interestingly, the crest of the umbrellabird and the hair style of many of the Indians in the area is strikingly similar. According to Sick, "Some Jivaro Indian tribes see in the *phalopterus* the emblem of a successful warrior: the crest symbolized the enemy's scalp. Other tribes fear the umbrellabird and believe him to be a demon. In the domain of *C. penduliger* the long wattle with its feathers is the part most appreciated. Several of these hung together are considered the rarest and most valuable of jewels".

Acclimatizing umbrellabirds to captivity is often difficult and may require continual extensive hand-feeding. Their diet in the wild is not completely known but does include various fruits and insects such as beetles, caterpillars, grasshoppers and butterflies. The fruit appears to be dicotyledons of various species. Cordier (personal communication) indicates they eat small palm nuts, cherry-like fruit growing directly on the bark of trees, berries and fruit of *Cecropia*. Although he did not observe them catching insects, he is convinced they do. Fruit is swallowed whole and the pips regurgitated later. Stomach contents of two adult males examined contained mainly semi-digested fruits with seeds and several elytra of Coleoptera.

Those birds in the Los Angeles Zoo are fed diced fruit (apples, oranges, grapes, bananas, papaya and melon), $\frac{1}{2}$ in. meatballs composed of ground meat, carnivore mix, geval, mockingbird mix and ground carrot and egg mix, $\frac{1}{2}$ in. balls of dog food, mice (one per bird per day), day-old chicks, mealworms, crickets, hard-boiled eggs and mynah bird pellets. When they first arrived, several had to be force fed but soon accepted new-born mice.

For several months, they were kept off exhibit in order to observe and properly acclimatize them. They were then moved into an aviary (4.5 × 5.5 × 5.5 metres) with other South American birds, mainly tanagers where they did well until some months later they were seen to catch and consume small tanagers (genus *Tangara*). On one occasion the senior author observed an adult male capture a house mouse (*Mus musculus*) and beat it against a perch like a kingfisher prior to swallowing it whole. From these observations it would appear that these cotingas are quite carnivorous. We then separated them into pairs and moved them into three large, heavily planted aviaries with bigger birds. In the spring of 1969 one pair was moved to a large flight cage where they are thriving. They remain aloof from other birds but appear to be compatible with other species, if they are not too small.

Once acclimatized, they appear to be a relatively hardy species. The New York Zoological Park records a male *C. penduliger* living 11 years and a female *C. glabricollis* surviving 12 years. Those in the Los Angeles Zoo are kept in unheated aviaries and do not appear to be adversely effected by cold weather. They have been active when ice formed on their drinking pools. During extremely hot weather (in excess of 38°C) they show signs of distress by gasping.

We have only noted one external parasite, the northern fowl mite (*Ornithonyssus sylviarum*). If the bird becomes weakened, the mite increase markedly and may be a predisposing cause of death. Mite activity is at its peak during the warmer months. Sick reports nematodes in the eyelids of two specimens. We have not seen this, but have noted it in a male Equatorial cock-of-the-rock (*Rupicola peruviana aequatorialis*).

Their main predator appears to be man. Based on our observations, hunting and trapping them does not appear to be seriously affecting the population. However, habitat destruction is being conducted at an alarming rate and if this has not affected them yet, it probably will in the near future.

REFERENCES

- HAPMAN, F. M., 1926. The Distribution of Bird-Life in Ecuador, *Bull. Amer. Mus. Nat. Hist.*
- MEYER DE SCHAUENSEE, R. 1968. *The Species of Birds of South America with their Distribution*, Livingston, Narberth, Pa.
- CK, HELMUT, and OANABÈ PRETO, 1955. "*Cephalopterus ornatus*" Geoffroy Saint-Hilaire (Cotingidae, Aves) *Rev. Brazil Biol.*, Vol. 15, No. 4, Dec.
- CK, HELMUT. 1954. Zur Biologie des Amazonischen Schirmvogels, *Cephalopterus ornatus*; *Journ. für Orn.*, Vol. 95.
- CK, HELMUT. 1951. An Egg of the Umbrella Bird; *Wilson Bull.*, Vol. 63, No. 4, Dec.

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BREEDING THE SILVER-EARED MESIA

(*Leiothrix argentauris*)

By RAYMOND FRANKLIN (Chesham, Buckinghamshire, England)

The Silver-eared Mesia has a very large area of distribution from the Malayas through Nepal, India, Burma, Thailand, Malaysia and Indonesia to south-western China. It is a bird of the scrub jungle with *Pododendron* and other bushes. It is a flock bird and the nest is described as being made of dry bamboo, leaves, grass and moss and lined with fine plant fibre; the eggs being small and pale blue with brown speckles. Both birds share the incubation.

During August, 1970 I obtained a pair of these beautiful but rather excitable members of the diverse family of babblers. The rest of the year they were kept in an outside planted flight with a few Chinese Painted Quail. They were over-wintered in my birdroom as I do not consider it fair to expect this type of bird to put up with the English winters. By all means give them access to an outdoor flight on fine days and bring them into the birdroom at night.

About the beginning of March, 1971 they were put outside in a flight 12 ft. x 12 ft. with a pair of Pagoda Mynahs (*Sturnus pagodarum*). Normally the Pagoda Mynahs are fairly peaceful birds so I thought they would be fairly amicable in a large flight which contains a few small bushes and a nice large clump of bamboo. All appeared to be going along peacefully so I hung a box 18 in. x 6 in. x 6 in. high up at an angle to the Pagodas; they began to show interest in the box about the second week in April, 1971 (but their married life is another story.)

Around the second week of May the Mesias commenced to build little nest in the middle of the bamboo clump with the exact material described above—I even obtained some fibre from a Borassus Palm Tree growing in a park! In an effort to stimulate the pair to nest I obtained ant pupae and a few live ants—which, incidentally, they used to perform the well known “anting” mainly associated with the Sturnidae. Copulation was observed on the 18th May and subsequently two mottled eggs were laid by the 25th May. They soon commenced to sit and both birds were seen to share the incubation of about two and three hours duration during the day. The hen sat at night.

The weather for the first week of June was warmish but very windy and I was rather apprehensive for the safety of the flimsy nest but all went well and on the morning of the 10th June 1971—which was extremely warm and windy—the cock was seen to dive into the bamboo with a mealworm so I decided to take a quick look and there was one baby. From then on I kept away so I did not see if the others hatched off. The following week was very wet but the adults did their duty and on the 23rd June I was pleased to see three fine babies clinging to a perch in the flight (previously I had only believed there to be two eggs). The young kept up a continual squeaking call often answered by the parent who every evening called them to roost in the bamboo clump (not in the nest). Live food, maggots etc. supplemented with ant pupae were supplied but at no time did I see any pupae fed to the babies. At eighteen days old one young died. On the 1st July the two remaining young were seen pecking about on the ground in an attempt to feed themselves and on the 2nd July the cock was seen displaying his red rump to the hen so I had hopes that they might nest again. All this had been going on with the Pagodas paying very little or no attention to them. On the morning of the 8th July I was in the flight scattering a few mealworms when, without any warning, the cock Pagoda swooped on the two babies and killed them. So that brought an abrupt end to my breeding attempt for 1971 of the Silver-eared Mesia.

I saw copulation and inspection of the old nest on the 13th July but I did not think the hen was really in breeding condition again and she died on the 19th July. To sum up I think there is a lesson here, and that is if possible to keep strictly to one pair of birds to an aviary, I certainly would. This misfortune was probably caused by not so much territory but insufficient food, as we do know that all these birds need a terrific amount of live food when breeding.

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MEYER'S PARROT

(Poicephalus m. meyeri)

By Dr. WILLIAM S. HAWKINS (Sunland, California, U.S.A.)

The Poicephalus group of parrots consists of eight main species and some twenty subspecies, all inhabiting the Ethiopian Region which in a broad sense includes all of Africa south of the Sahara Desert. The various Senegal Parrots, Rüppell's Parrot and Meyer's Parrot are the representatives most commonly found in aviaries. The latter have never been common in collections in the U.S.A., but with the changes in import restrictions, a few of these birds are now available.

Meyer's Parrot is variously referred to as the Brown Parrot or the Sudan Brown Parrot. Seven subspecies of this bird are recognized, inhabiting different areas and showing very slight differences in coloration. Differentiation would require an ornithological expert. In general, all are called Meyer's Parrots, named in honour of Dr. Bernhard Meyer, (1867-1836), a German dentist who contributed much to the fields of botany and ornithology during his era. Although the bird was first discovered by Rüppell, the name, Meyer, was dedicated in recognition of this man's work.

Broadly speaking, the Poicephalus parrots somewhat resemble larger species of the Lovebirds. Their range and behavior are also somewhat similar. Meyer's Parrots are widely distributed and are partially migratory, following food and water supplies. They are found largely in savannah woodlands, along water-courses, and in acacia groves, but are absent from the West African forest belt. They appear to be of a gregarious nature.

Although not truly dimorphic, there does seem to be more sexual differentiation than is visible in most psittacine birds. This is not as apparent, however, as in the case of Rüppell's Parrot, in which the female is definitely more brightly colored than the male. Most authorities state that the cock Meyer's is larger and more brightly colored than the female, the "color" being the gold on the head and the wing butts. In the case of the pair which I have this seems to be reversed so perhaps the "difference" is open to question.

These birds are quiet and steady in the aviary and are said to make excellent caged pets if hand-raised. Mine imitate a pair of Indian Gnatcatchers in an adjacent aviary to perfection, but I have no knowledge just how proficient their ability to mimic might be. They are not shy or quarrelsome, either between themselves or with their aviary neighbors. Certainly their diminutive size, beauty, and disposition would make them an ideal "pet" bird should they ever become readily available.

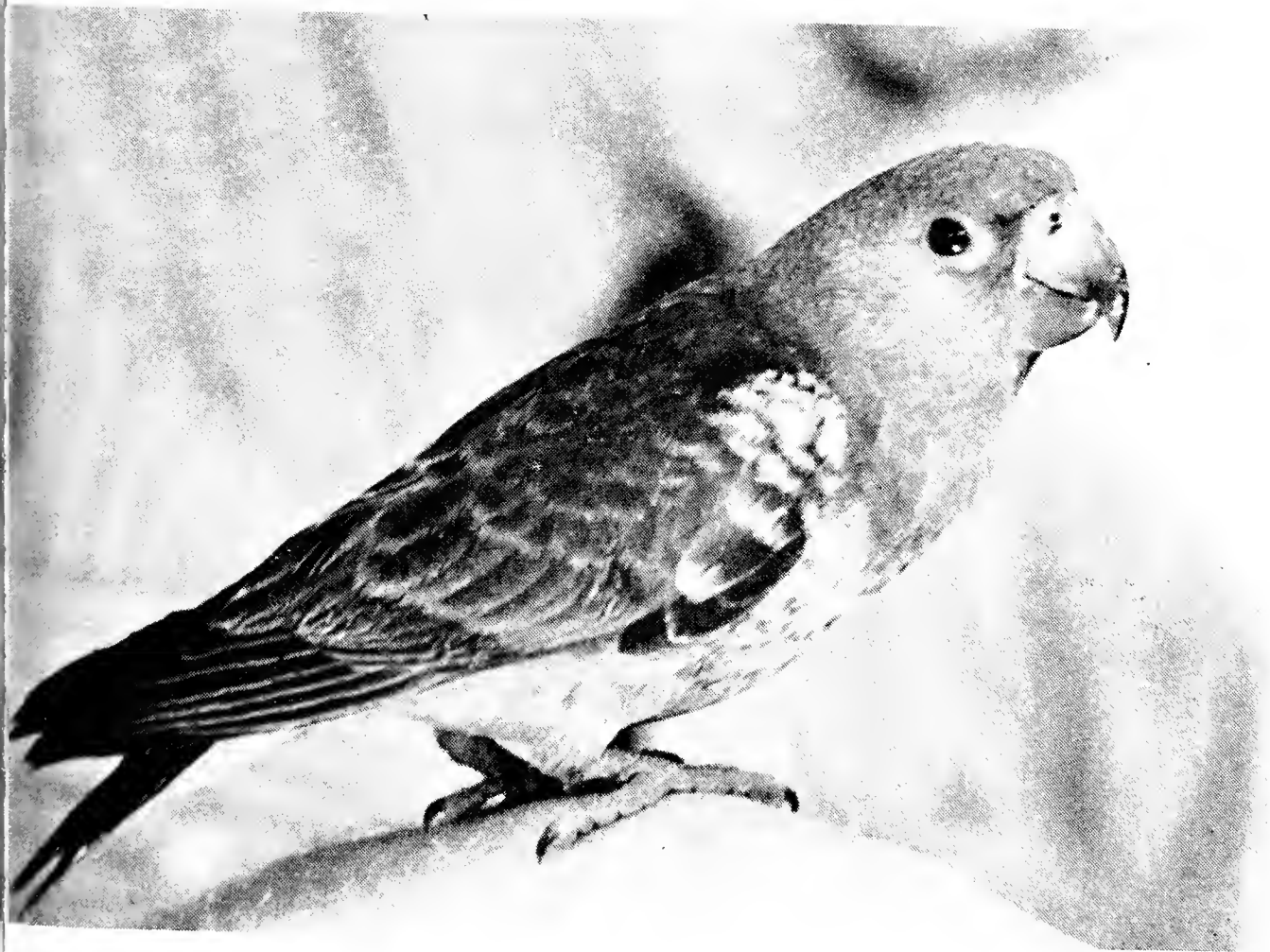
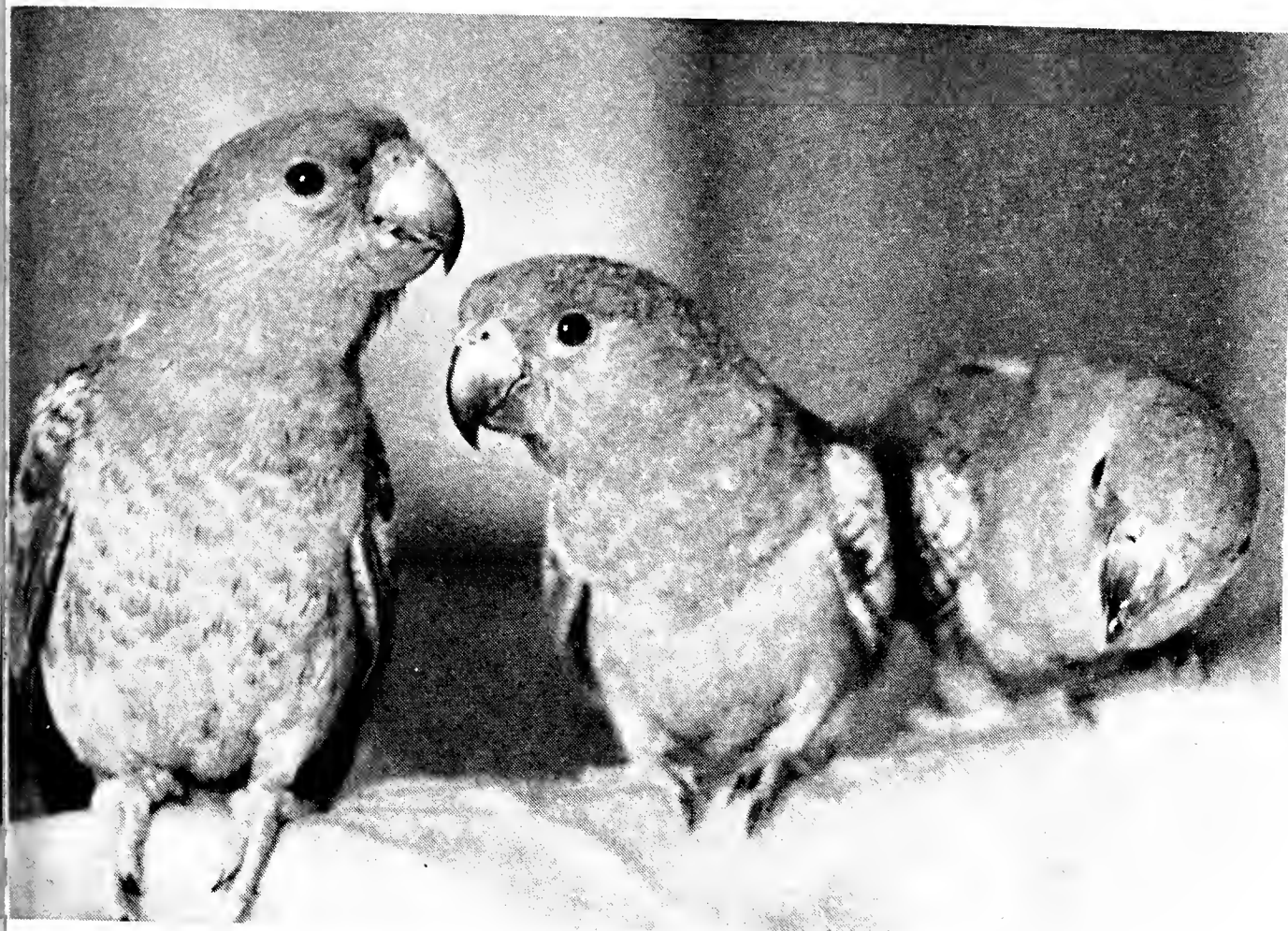
The pair which I now keep were purchased in the late summer of 1969 as immature and newly imported birds. They were kept in an indoor flight-cage without artificial heat until the following spring approximately six months, and during this sojourn they proved to be very tractable. No undue stress was noted during this period of acclimatization. The usual seeds were furnished with no particular attention to green food or fruits. Although not tame, these birds never exhibited undue fright during this confinement.

With the advent of spring the pair was placed in an outdoor aviary four by twenty-three feet, alone. A nest-box was provided, ten inches square by eighteen inches deep, containing about four inches of decayed wood. During the summer they completed their adult moult and became much more colorful. Daily baths were provided by means of a sprinkler system, and this they enjoyed immensely. Green food and fruit were also provided which they were very fond of and always carried to the drinking fountains in the fashion of many of the Asiatic parakeets.

Late in the summer of 1970 the birds began to evince an interest in their nest-box and in early September three eggs were laid. The hen had made a small scrape in one corner and seemed to incubate alone while the cock often perched on the ledge outside of the box. This coincided with the most extreme heat in this part of Southern California and also with my own vacation, so that the birds were not watched carefully. All three eggs proved to be fertile, but none hatched which came as no surprise considering the extremely high temperatures.

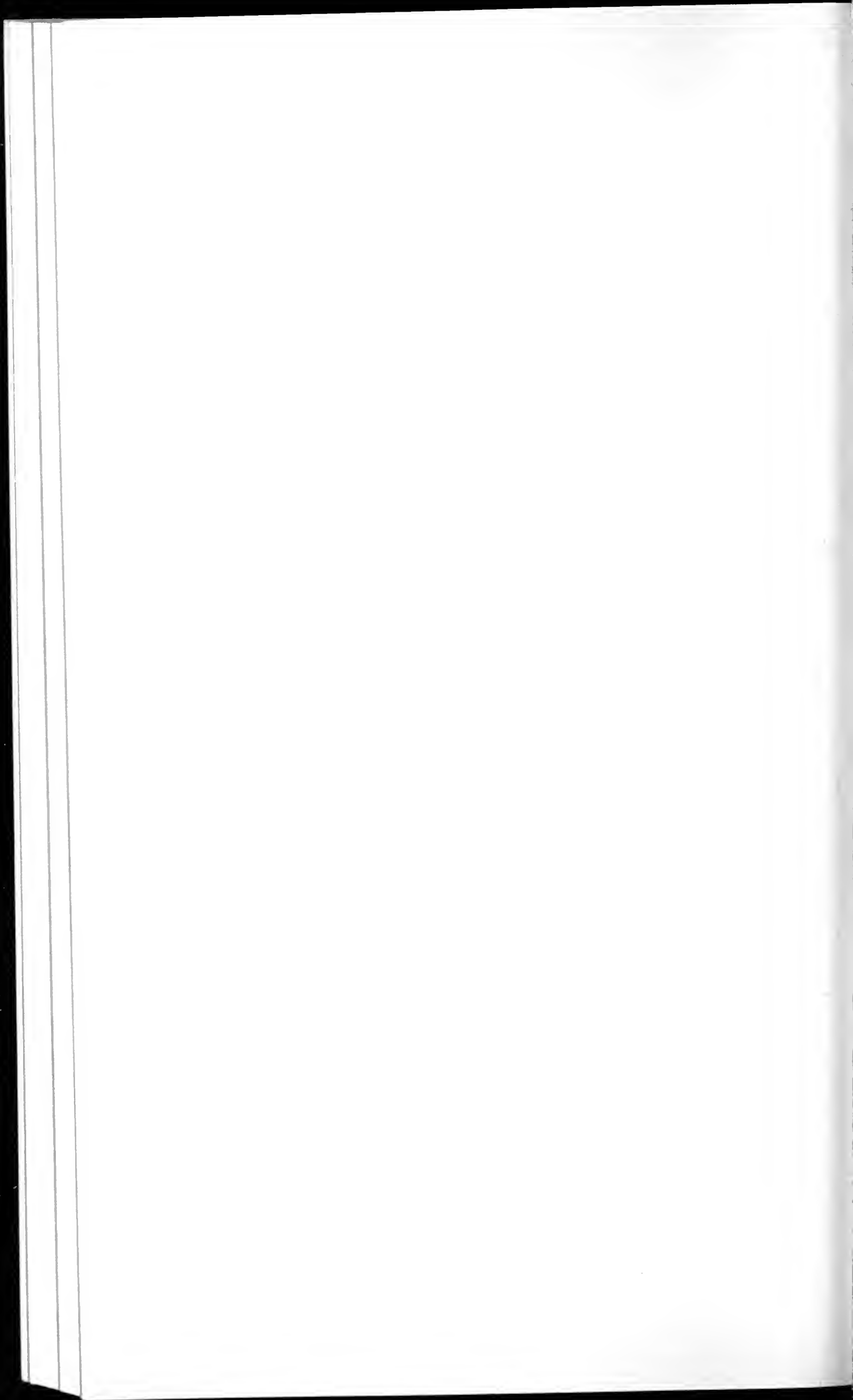
In 1971, near the first of February, the birds once again began to show an interest in their nest-box. In the first week of February three eggs were laid. By this time the birds were even steadier, but both of them always appeared at feeding time or during any disturbance in the aviaries. On 9th February the severe earthquake struck this immediate area of the state, and I felt sure their project would once again be ill-fated. This, however, was not the case. The hen did not leave the nest, and subsequently on or about the 21st February, all three eggs hatched, two hatchlings on the first day and the third two days later. Both parents were extremely attentive, the cock in particular showing interest in their activity. The same seeds were furnished, but in addition, a generous supply of soaked oats was provided along with sweet apple, green food, whole wheat bread, and a few peanuts every morning. These extra foods were consumed eagerly with a decided lessening of interest in the regular seed mixture.

The young birds appeared similar to infant Lovebirds with patches of white down. They were checked once a week without causing any apparent alarm to the parents, and the infants always seemed fat and well fed. The smallest, however, appeared to be lagging and on 7th May, this bird was given to a friend for hand-feeding. Its feathers were well developed at this time. This bird was successful



Young Meyer's Parrots (4 months old)

[*Michael Espe*



ised and developed perfectly, only to meet with disaster later on by way of an accident. The two remaining young were successfully reared by their parents and left the nest about three weeks later. On emergence from the nest these youngsters, quite unlike their parents, proved to be hysterical in confinement. Both, within twenty four hours, had broken their necks in dashing about the flight.

In October of the same year the adults once again went to nest and produced three fertile eggs. These hatched on the 12th November and received the same exemplary care from both parents. However, since the weather was becoming very chilly and it appeared that the young would fledge during the rainy season, I decided to remove the three of them on the 9th December. At this time they were still covered with down and were very fat and uniform in size. Through the expertize of Eleanor Cooley, all three were successfully hand-raised and were fully dependent by the first week in February.

The juvenile birds are smaller and duller editions of their parents, lacking the gold markings and of a more or less uniform grey shade. The brilliant sea-green rump patch is present, however. They are very gentle, but even having been hand-raised are inclined to panic very easily in strange situations. Their diet at four months of age is identical with the parents'.

As of this writing, the 1st March 1972, the parents are once again incubating fertile eggs, this time, four in the clutch.

Have these birds been bred before in the United States? It would be of interest to me to find out the details if so, since they must still be considered one of the rarer psittacines kept in captivity. I am now inclined to attempt to breed them in a colony since their behaviour seems similar to that of the Lovebirds. Hybrids have been reported with Appell's Parrot and are said to be very beautiful birds.

Certainly Meyer's Parrots with their many attributes deserve a firmly established place in our avicultural endeavours.

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NOTES ON THE BEHAVIOUR OF AFRICAN PARROTS OF THE GENUS *POICEPHALUS*

By D. M. HOLYOAK and D. T. HOLYOAK (Weybridge, Surrey, England)

The behaviour of the eight species of the African parrot genus *Poicephalus* is surprisingly little known considering the frequency with which some of the species are kept in captivity. However, numerous other groups of parrots are similarly little known, although the other large genus of African parrots, the lovebirds *Agapornis* spp., has been closely studied by Dilger (1960, 1964).

Poicephalus has two rather large species, the Brown-necked Parrot *P. robustus* and the Red-headed Parrot *P. gulielmi*, and six smaller ones of which we were able to watch the Yellow-bellied Parrot *P. senegalus*, Brown-headed Parrot *P. cryptoxanthus*, Brown Parrot *P. meyeri*, and Rüppell's Parrot *P. ruppellii*. All of these are confined to various parts of Africa south of the Sahara. Mackworth-Praed and Grant (1955, 1962, 1970) give details of the ranges, subspecies, food and general habits of these species in the wild and plates illustrating them.

Observations were made on the species listed above at the London Zoo between January 1970 and June 1971. Most of the observations were on three *P. senegalus*, three *P. cryptoxanthus*, two males of *P. meyeri* and two *P. gulielmi*, a few on singles of *P. robustus* and *P. ruppellii*. These birds were housed indoors in large all-wire cages.

None of the birds bred during the period of observation and it was not possible to be sure of the sex of several individuals. Because of this we were unable to judge the function of many behaviour patterns and may not have seen the full repertoire of display from any of the species. Nevertheless it seems worthwhile publishing the information we have recorded as we are unable to make further regular observations and it may be of value in comparative behaviour studies and in encouraging further investigation. The behaviour patterns are compared throughout this paper with those of lovebirds, which have been described in detail by Dilger. Dilger's terminology of displays is followed.

MAINTENANCE ACTIVITIES

These include behaviour concerned with maintenance of plumage, skin parts and skin; some of the motor patterns used in these behaviour patterns appear to have been the precursors of ritualized agonistic and epigamic displays.

Bathing was only seen once, from *P. senegalus*, although splashes around the water dishes in the cages suggested it was fairly frequently performed. The bird seen to bathe stood on the rim of a water dish and ducked its head into the water several times, then repeatedly jumped into the water with outstretched wings and tail and quickly jumped out again. At

entering the water several times it flew to a perch, preened lightly and then rested. Lovebirds also bathe by quickly entering and leaving the water (Dilger 1960, 1964) but hanging parrots *Loriculus* spp. stand in the water for longer periods (Buckley 1968).

Head-scratching was performed directly (foot under the wing) in all the species studied, as previously recorded by Brereton and Immelmann (1962).

Stretching movements were similar to those recorded in *Loriculus* and *Agapornis*. The commonest movements were stretching of one leg with the ipsilateral wing and half of tail, followed by the same on the other side of the body, stretching both wings upwards over the back, and various plumage fluffing and sleeking movements.

Preening and oiling were similar to these actions in *Agapornis* and *Loriculus*.

Drinking is performed in the same way as in *Agapornis* in all species watched, by dipping the bill into the water and sucking it up, without throwing the head back as some other parrots and most non-psittacines do.

Feeding. The birds studied were fed on a diet of mixed small seeds most of which were picked up in the bill, husked and swallowed without use of the feet. Larger food items were picked up in a foot or in the bill and transferred to a foot, then held up in the foot while being chewed. When fed with long strips of carrot none of the six species held it down with the foot as Budgerigars *Melopsittacus undulatus* and grass parakeets *Crotophaga* spp. were seen to do. None of the species was seen to scratch the ground litter with a foot as seen in *Psittacula* and *Cyanoramphus* spp.

Bill-wiping was frequently performed with a side to side stropping motion on perches after feeding. The bill was also scratched with movements similar to those used in head-scratching. The legs and feet were frequently nibbled gently with the bill tip using a similar action to that often used when preening.

AGONISTIC DISPLAYS AND FIGHTING BEHAVIOUR

Threat displays and fighting behaviour are highly ritualized in *Cephalus* so that harmful fighting is rare or absent. The posturings used are similar to those in *Agapornis*, but with differences in intensity and frequency.

Wing-threat displays are commonly used. At low intensity the carpal joints are held out from the body exposing bright patches of colour on the sides of the carpal joint (Fig. 1A). With increasing aggression the carpal joints are first flicked or shivered and at high intensity the whole wings are held vertically over the back (Fig. 1B, 1C, 1D). Carpal holding as described was seen in *gambeli*, *cryptoxanthus*, *senegalus* and *ruppelli*; carpal-flicking or shivering in the same four species, and wing-holding in

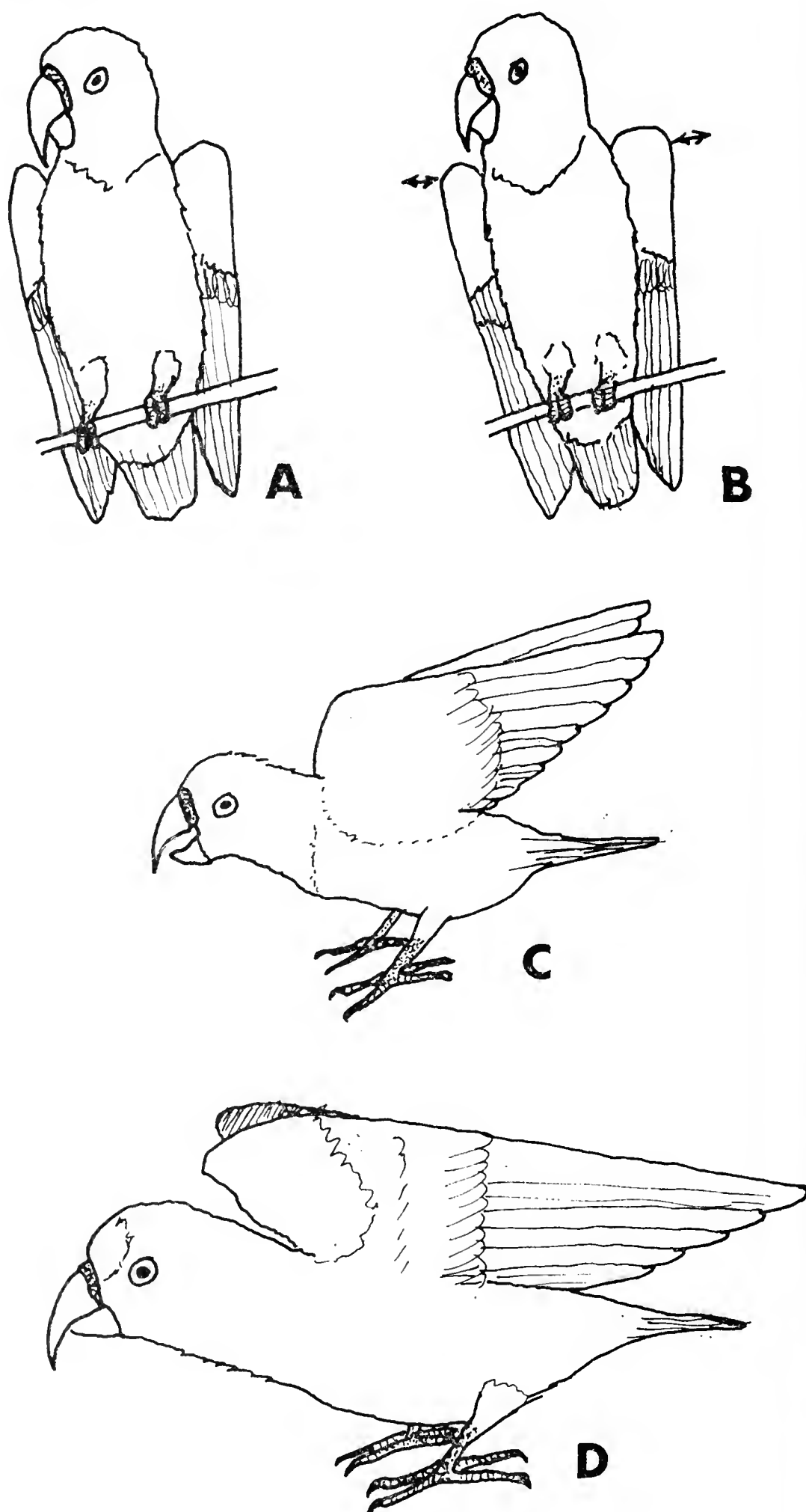


Fig. 1

Wing-threat displays of *Poicephalus* spp. A Carpal-holding, B Carpal-flick, C Wing-holding in *P. senegalus*, D Wing-holding in *P. guillemi*

cryptoxanthus, *gulielmi* (less ritualized than in *cryptoxanthus*, without accompanying calls), *senegalus* (highly ritualized and accompanied by calls), *meyeri* (only seen a few times, probably not highly ritualized in this species), and *ruppellii* (seen to flap partly opened wings, but not to wing-hold in same way as other species). These displays expose brightly coloured plumage on the carpal joint and wing-linings, yellow in *cryptoxanthus*, *meyeri*, *senegalus* and *ruppellii*, red in *gulielmi*. The bright patches of plumage in the other species of the genus suggest they have similar displays.

Calls used in agonistic display include sharp, repeated clicking notes in *gulielmi* and *senegalus*. At first we thought these notes were produced mechanically by bill-clicking, but later we saw a *gulielmi* giving them while holding food in its bill so they must be vocally produced. *P. cryptoxanthus* gives loud squeaks and a repeated *swi swi* call while giving carpal-held and carpal-flicking displays and loud squeaks while wing-holding. *P. senegalus* was heard to give repeated loud, shrill squeaks as the usual accompaniment to wing-holding and sometimes a low, throaty grating sound with this display.

Lunging and gaping movements were frequently directed at birds that approached too close to the performing individual. Gaping in threat was seen in *gulielmi*, *senegalus*, *cryptoxanthus* and *meyeri* (Fig. 2A) and lunging was seen in *gulielmi* and *senegalus* (Fig. 2B). Gaping always accompanied lunging.

Aggressive-walking towards an opponent resembling the rushing display of *Loriculus* and *Agapornis* was seen at high intensity in *gulielmi* and *ruppellii* and at low intensity in *cryptoxanthus*, *meyeri* and *senegalus* (Fig. 2C). In this display a bird walks towards another with lowered head and sleeked plumage and long pacing strides.

Striking with the feet which is commonly used in threat and fighting by *Agapornis* (Brockway 1964 a) and some other parrots was never seen. *Forward threat postures*, merging with aggressive walking or lunging and gaping, were seen to be used by all six species (Fig. 2D); the bright forehead feathers of *gulielmi* and the yellow forehead of some forms of *meyeri* are made prominently visible in this display.

Upright threat postures were infrequently seen, except in *gulielmi*, where the red forehead patch is made conspicuously visible (Fig. 2E). *P. gulielmi* usually used these displays when threatened but unwilling to fight.

Fighting behaviour was seen a few times in *cryptoxanthus* and *gulielmi*, but fighting was infrequent. The aim in fighting was mainly to peck the head of the opponent as in *Agapornis*; this highly ritualized fighting ensures that little physical damage is likely to be caused to the participants in a fight. Occasional pecks were directed at the opponents wings or rump, but it was quite apparent that pecking was aimed mainly at the bill as

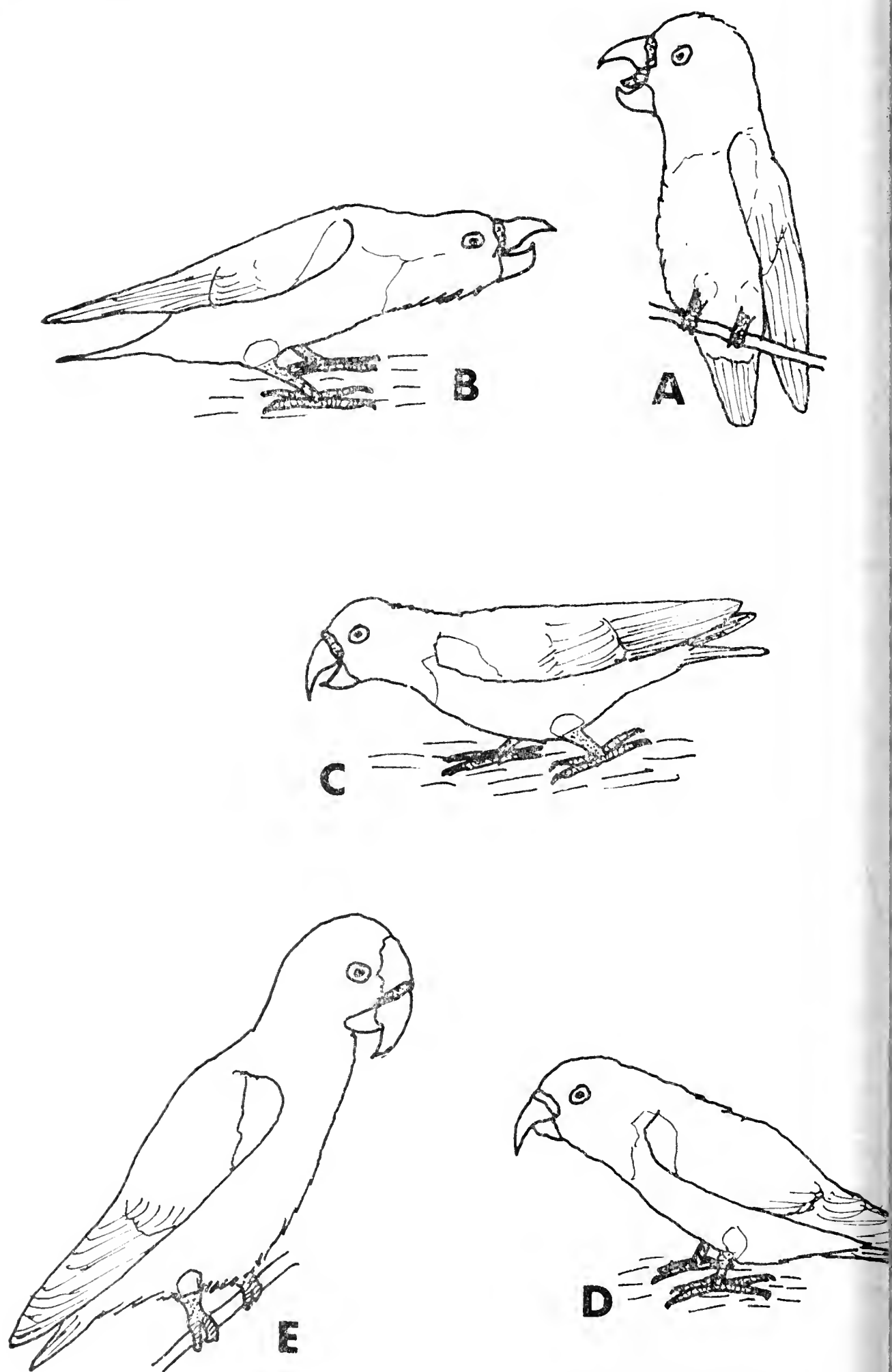


Fig. 2

Agonistic displays of *Poicephalus* spp. A Gaping, B Lunging, C Aggressive
D Forward threat display, E Upright threat display of *P. gulielmi*.

opportunities to peck at other parts of the opponents body were usually ignored.

Submission to aggressive display is indicated by the threatened bird fluffing its plumage, turning away, retreating, or various combinations of these.

The various wing-threat displays seem likely to have evolved from movements of flying towards the opponent, whilst lunging, gaping and aggressive walking are ritualized movements of walking towards or pecking towards the opponent.

EPIGAMIC DISPLAYS

Various displays similar to those used in sexual displays by *Loriculus* and *Agapornis* were seen. As breeding and copulation were not seen in this study it was impossible to be sure of the exact context in which these displays are usually performed.

Switch-sidling displays were seen to be performed by *gulielmi*, *cryptoxanthus* and *meyeri*. *P. meyeri* was seen to give a highly-ritualized switch-sidling display in which a male bird made sudden complete spins around on the perch as it ran backwards and forwards giving short twitters, whistles and a repeated loud nasal *twar* call, with carpal joints held out from the body and occasionally shivered (Fig. 3A). This display was performed rapidly for several minutes at a time, with a mechanical work motion. *P. gulielmi* gave a less ritualized display, without calls, with occasional deep bowing movements which were not present in displays of *meyeri* (Fig. 3B).

cryptoxanthus gave a similar display to that of *gulielmi*, but lacking the bowing movements which were reduced to a slight head-dipping action, giving squeaking calls.

Foot-lifting displays similar to those of some lovebirds were seen to be used by *cryptoxanthus*. In this display a bird sidling close to another bird lifts one foot as if about to head-scratch and then either lowers it again (Fig. 3C) or head-scratches, the foot nearest the other bird being lifted most. This display may have originated from head-scratching used as a pre-copulation activity or from the movements of stepping on to the mates prior to copulation.

Wing-displays similar to those used in agonistic display (carpal-holding, carpal flicking and shivering) were often used by birds that did not appear to be threatening another or by birds with apparently ambivalent motivation, so as these displays form one component of the epigamic switch-sidling display, they seem likely to function in sexual as well as agonistic signalling.

Allopreening was seen in *senegalus*, *cryptoxanthus*, *meyeri* and *ruppellii*. At one time one sleeked bird was seen nibbling the head or neck feathers

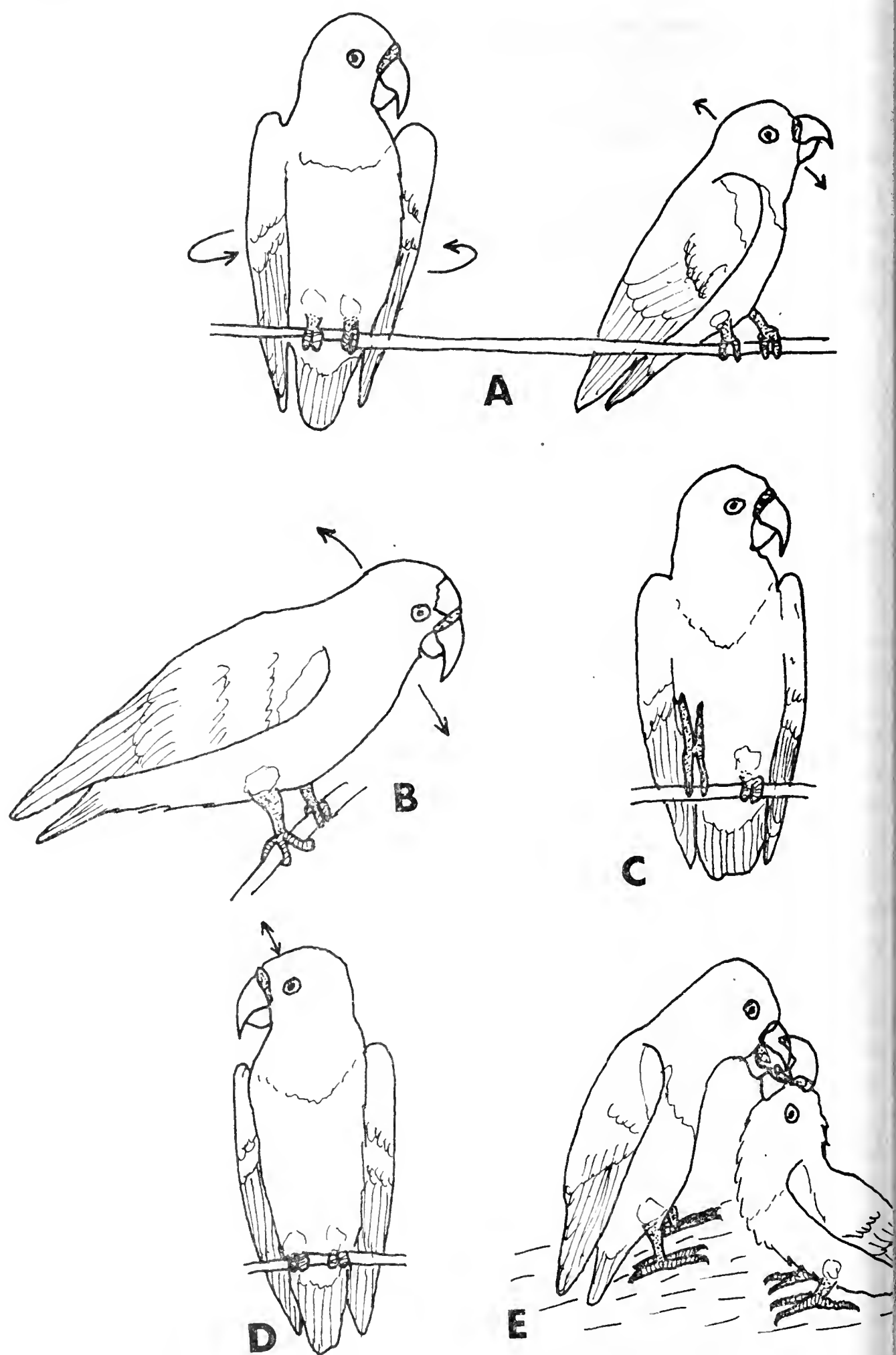


Fig. 3

Epigamic displays of *Poicephalus* spp. A Switch-sidling in *P. meyeri*, B Switch-sidling in *P. guielmi*, C Foot-lifting, D Head-bobbing, E Courtship-feeding

of another which was more fluffed. Individuals of *P. cryptoxanthus* were seen to allopreen individuals of *P. senegalus* in the same cage and vice versa.

Head-bobbing was seen to be performed by *gulielmi*, *cryptoxanthus* and *senegalus*. The head is raised and lowered with a quick bobbing movement similar to that used when regurgitating food prior to courtship feeding, but no food is produced (Fig. 3D).

Courtship-feeding was seen in *gulielmi*, *cryptoxanthus* and *senegalus*, but often the movements of courtship feeding were seen without food being passed from one bird to the other. The movements of courtship feeding were similar to those used in the Budgerigar (Brockway 1964 b; Fig. 3E).

Changes in pupil-size accompanied many displays, but we noticed this too late to make any detailed observations.

ACKNOWLEDGEMENT

We are grateful to Peter Olney, Curator of Birds, for facilitating our observations on birds at the London Zoo.

REFERENCES

- FRERETON, J. le G. and IMMELMANN, K. 1962. Head-scratching in the Psittaciformes. *Ibis* 104: 169-175.
- ROCKWAY, B. 1964 a. Ethological studies of the Budgerigar (*Melopsittacus undulatus*): non-reproductive behaviour. *Behaviour* 22: 193-222.
- ROCKWAY, B. 1964 b. Ethological studies of the Budgerigar: reproductive behaviour. *Behaviour* 23: 294-324.
- BUCKLEY, F. G. 1968. Behaviour of the Blue-crowned Hanging Parrot *Loriculus galgulus* with comparative notes on the Vernal Hanging Parrot *L. vernalis*. *Ibis* 110: 145-164.
- ILGER, W. C. 1960. The comparative ethology of the African parrot genus *Agapornis*. *Z. f. Tierpsycholog.* 17: 649-685.
- ILGER, W. C. 1964. Evolution in the African parrot genus *Agapornis*. *Living Bird* 1964: 135-148.
- RAED, C. W. MACKWORTH and GRANT, C. H. B. 1957. Birds of eastern and north-eastern Africa. 2nd. edn., Ser. 1, Vol. 1. London, New York and Toronto.
- RAED, C. W. MACKWORTH and GRANT, C. H. B. 1962. Birds of the southern third of Africa. Ser. 2, Vol. 1. London, New York and Toronto.
- RAED, C. W. MACKWORTH and GRANT, C. H. B. 1970. Birds of west Africa. Ser. 3, Vol. 1. London, New York and Toronto.

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THE ORNITHOLOGICAL PARK IN THE DEPARTMENT OF LA DOMBES, FRANCE

By J. DELACOUR (Clères, France)

In these days of astonishing and disorderly proliferation of zoos and bird parks throughout the world, it is a rare pleasure to discover a really good one. But it is just what has happened to me and to my friend Mr. and Mrs. Paul Jourde, when we stopped at the small town of Villars-les-Dombes on the 5th June 1971.

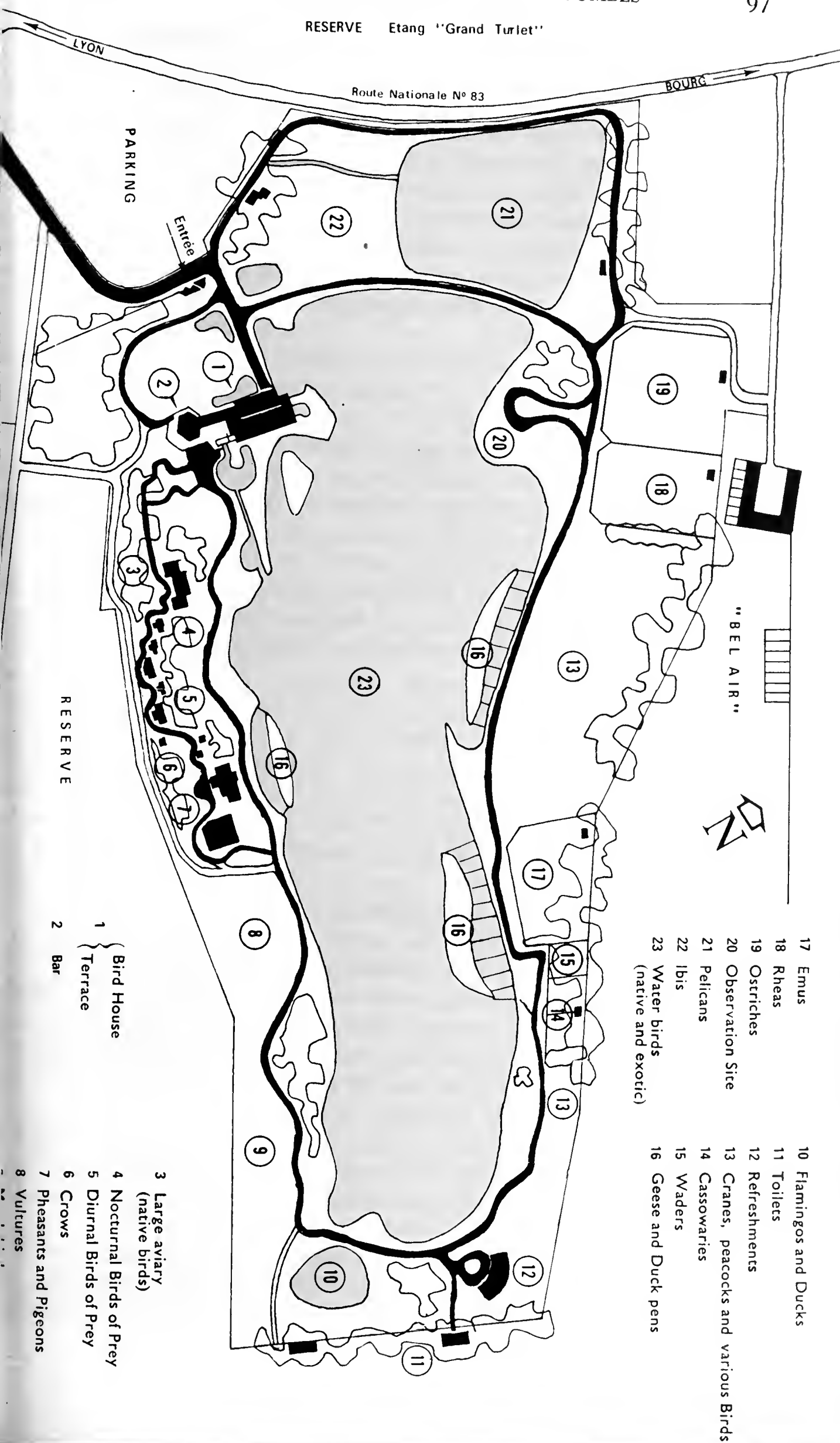
It is not that this new bird park was unknown to me. Three or four years ago, I received at Clères a group of leaders of the Département (County) de l'Ain, which is situated in the east of France, north of Lyons and west of Geneva. The district of La Dombes extends west to the Rhône river, north to Bourg-en-Bresse, east to Ambérieux and Pérouges (an extraordinarily well and completely preserved medieval town) and south to a few miles north of Lyon.

It is one of the largest "wetland" in Western Europe. The fairly flat country over 40 miles wide covers 11,000 hectares; it is dotted with innumerable lakes, the home of large populations of wild ducks, herons, small waders and other water birds. The County authorities were well aware of its great importance for wildlife, and they had decided to set up a "Parc-Reserve". They not only wanted to organise a refuge for breeding and migrating waterfowl, but also to show the public, in a well planned and kept park, the 200 local species as well as a number of exotic ones. They intended to interest all classes of people in bird life, local as well as tourists, by showing the birds under as near as possible natural conditions and so to contribute to their conservation.

The delegation that came to Clères included the Deputy Prefect, President of the County Council, M. Saint-Cyr, a veterinarian and keen animal lover, M. Faure, the director of Public Works, another nature enthusiast. Dr. Ciarpaglini and I, also in Paris Prof. J. Noulet, Director of the zoos, and his assistants, tried to help them in all possible ways in the planning of their park. A great deal of skill, time and money was spent on the project and the bird park was opened on 18th July 1971. I was unfortunately unable to attend which I much regretted. The curator, a former assistant of the Paris Zoo, M. Bernard Liauzu, was well known to me; I realised that he was a capable technician and, working under M. Faure's directives, he was likely to organise and to keep the park well. But one never knows, and previous disillusiones in different countries, when I had seen for the first time the results of well intentioned good advice, have made me suspicious. My wariness, this time, proved quite unnecessary. The Parc Ornithologique de la Dombes is a success and no doubt one of the best of its kind in the world.

It consists mainly of a long lake (Etang Grand Turlet) with smaller ones at both ends. The landscape is typical of a marsh, with comparatively

RESERVE Etang "Grand Turlet"



trees, mostly poplars and willows. Many others, however, have been planted and are growing well; they will add much to the charm of the grounds as time goes on. All around the lake is a walk, and at the side away from the lake, are groups of aviaries and enclosures for various kinds of birds, all elaborately built and planted and very attractive. Near the entrance is an excellent birdhouse, with large, planted indoor flight luxuriously finished and fitted, which compares favourably with the average bird house of large, modern zoos. A very attractive bar-restaurant in the shape of a rotunda, with a wonderful view of the lake, stands near-by. The adjoining plan shows what the park is like better than a more detailed description.

The collection is extensive and consists of all sorts of birds from Ostriches to Sunbirds and Hummingbirds. The accommodation is roomy, well built and well kept. Good breeding results were already achieved in 1970 as the following list shows:

Native Birds reared: Mute Swans, Pintails, Red-crested Pochards (they also breed wild locally), Shelducks, Teal, Pochards, White-eyes (also a rare local breeder), Shovelers, Gadwalls, Greenfinches and Yellowhammers. (A total of 127 birds).

Foreign Birds reared: Bronze-winged, Galapagos, Senegal, and Abyssinian Black-billed Doves; Golden, Swinhoe's and Reeves Pheasants; Red Junglefowl, Peafowl; California, Chinese Painted and Coromandel Quails; Tasmanian Waterhen. Egyptian Geese; Paradise Sheldrake; Carolina, Mandarin, Koloa Ducks; Chiloe Wigeon; Chinese Pintail; Indian spotbilled, Philippine, Pacific grey and Rosy-billed Ducks; Fulvous Tree Ducks, Chestnut and Marbled Teal (Total 334 birds).

In addition 21 birds were reared by the parents in the free state: Tufted Duck, Gadwall, Garganey, White-eyed Duck and Red Junglefowl. 25 local breeding birds were hand-reared: Long-eared, Brown and Little Owls, Black Kite, Kestrel, Montagu's Harrier, Purple Heron, Night Heron, Little Tern, Grey Wagtail and Oriole.

There is no doubt that even better results will be obtained in the future when the birds have settled down completely.

The following wild species have nested in the park in 1970; Mallard, Gadwall, Red-crested Pochard, Tufted Duck, Coot, Moorhen, Kestrel, several Reed and other warblers, Stonechat, Black Redstart, Great Tit, Martin, Starling, Tree Sparrow, Greenfinch, Goldfinch, Reed Bunting and many others outside the Park.

Among the most interesting displays are those of the bird houses where many species of Toucans, Touracous, Tanagers, Barbets, Woodpeckers, Jays, Starlings and seedeaters, as well as a few Sunbirds and Hummingbirds are well exhibited.

Several large outdoor aviaries are well worth mentioning: one with a big collection of Plovers, Sandpipers, Terns, Avocets, Stilts etc., others with native hawks, eagles and owls. Vultures are kept wing-clipped.

large areas with many leaning dead trees. Pheasant pens, also containing doves, house an excellent collection of birds. A pretty good sized pond stocked with different Flamingoes and some of the rarer ducks.

Quite remarkable is the Pelicans lake of three acres under almost natural conditions; a nearby marshy enclosure is inhabited by many species of Ibises, Storks, Herons, a few ducks and Geese (Redbreasts, Radjahs, Ross) Ostriches, Rheas, Emus, Cassowaries, Jabiru and Marabou Storks, and several species of Cranes live in large, grassy and bushy enclosures while Crown, Stanley, and Demoiselle Cranes, Peafowl and Red Junglefowl roam freely throughout the Park. On the lake are Muscovy, Black, and Whooper Swans, Chinese (wild) Emperor, Snow and Lesser White-fronted geese and many ducks. It requires a large number of waterfowl to show at all on a 20 acre lake! On the north side of the lake, between the shore and two long islands, some twenty pens have been built to house the pairs of swans and geese which have to be mated. Some Crested Grebes are also to be seen here. Hidden away are very good buildings stores, kitchens, winter shelters, laboratories, hospital, etc. (Bel Air.)

In conclusion, I wish to say that a visit to the Parc Ornithologique de la Dombes is well worthwhile and any of our members travelling in eastern France and Switzerland will find it rewarding to stop for a few hours at this very well-built, stocked and kept bird park.

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ADAPTIVE SIGNIFICANCE OF BILL SHAPE IN THE PALM COCKATOO

(*Probosciger aterrimus*)

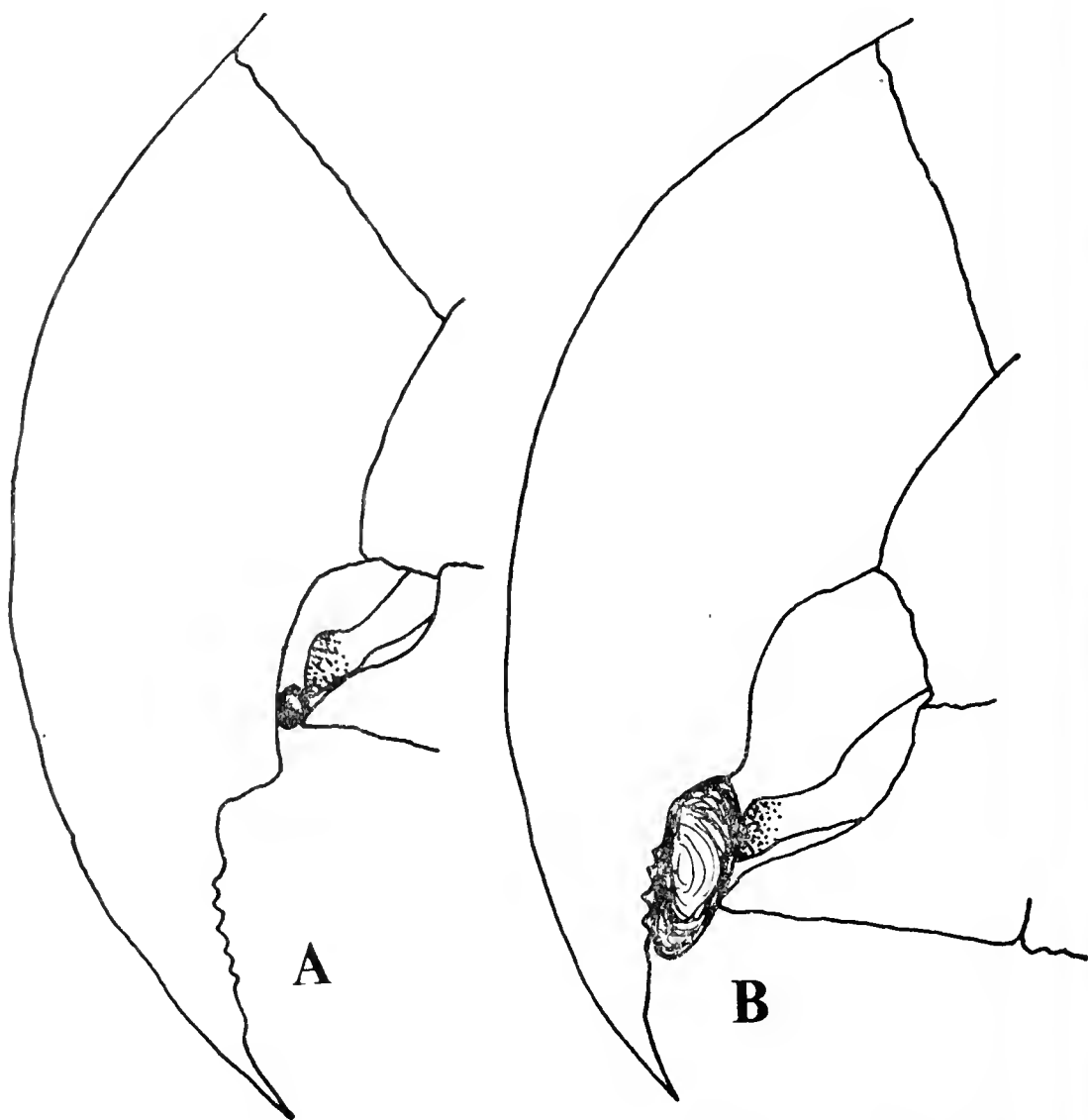
By D. T. HOLYOAK (Weybridge, Surrey, England)

The Palm Cockatoo is unique among parrots in having two flat projecting areas of rhamphotheca on the inside of the upper mandible, forming three step-like levels. A number of other large parrots have two similar steps. While watching a Palm Cockatoo at the London Zoo I noticed that it used the large innermost "step" when mandibulating all food items (Fig. A) and the middle "step" with larger ones (Fig. B).

In a later visit to the Zoo I fed this bird with an assortment of seeds of different sizes and made notes on the way they were treated. Twenty almonds of average diameter about 10 mm were all husked and crushed while being held in the middle "step", as were three walnuts of about 15 mm diameter. Twenty sunflower seeds 2-3 mm thick were all husked on the innermost "step" as were assorted apple and orange pips of slightly

smaller size. The outermost "step" appears to be used only for tearing at large fruits and not for husking seeds or nuts.

The "stepped" inside of the lower mandible probably enables Palm Cockatoos to feed efficiently on both large and small seeds, whereas a bill of this size without "steps" would probably be inefficient when dealing with small seeds.



Palm Cockatoo's method of husking A small seeds, B large seeds.

* * *

RARE BIRDS OF THE SEYCHELLES

By BRIAN C. SINFIELD

Some of the most beautiful and isolated tropical islands in the world, the Seychelles are strewn like diamonds across the blue seas of the central Indian Ocean 1,000 miles from the coast of East Africa. They are unique in many ways. The main group consists of 32 granitic islands scattered around the central and largest island, Mahé. They are thought to be the mountain peaks of a subterranean continent. Strewn everywhere are gigantic granite boulders worn smooth and sculptured by the action of the sea and the winds. Great slabs of granite stare out from the mountain slopes and thick vegetation grows profusely wherever the granite gives way to soil.

Apart from the geological aspect the islands are rich in plant and animal life. There can be few places on earth that can boast of eight or nine of the world's rarest birds. The fact that the Seychelles can do so is not necessarily to its credit. The islands have been inhabited by man for nearly 200 years and during this period almost all of the endemic forests have been wiped out, (the trees yielded fine timber that was heavily exported) together with practically the total populations of birds and reptiles (giant tortoises and crocodiles.) The crocodiles were killed off shortly after the first settlers appeared. Apart from the direct slaughter of birds by man and the rapid destruction of their habitats, the bird populations further suffered from the introduction of cats to the islands and the now ubiquitous Indian Mynahs (*Acridotheres tristis*) and much later, in 1950, the Barn Owl, which was introduced to control the rats (so introduced). It soon, however, found that other birds were far more dangerous than rats. The conclusions are obvious.

Because a bird is classified rare does not necessarily mean that it is especially attractive. In fact in the Seychelles many of the rare species are remarkably nondescript. One of the exceptions, although not particularly rare, is the Fairy Tern which nests on Cousin Island and is one of the most delicately beautiful birds I have ever seen. All of these birds, however, are extremely interesting.

On La Digue island several miles from Mahé is the last stronghold of the active *Veuve* or Paradise Flycatcher (it was once plentiful on several of the other islands). There are reputed to be less than 50 of these birds on La Digue and these represent the last population of Seychelles Paradise Flycatcher in the world. A guide took me to where a pair were nesting. After a short trek through coconut palms along a track worn in by bare feet, the guide stopped abruptly beneath a Takamaka tree. Following his gaze I looked up to see, four feet above my head on a thin branch, a small compact nest about three inches in diameter. It was woven delicately with plant fibres and small wads of wild cotton. In

the vain hope of actually seeing one of the birds I started to position myself some distance from the nest lest I frighten them off. The guide however, assured me that there was no need to move. Unbelievably stood and waited. Sure enough in a matter of minutes a female Paradise Flycatcher appeared. She flew directly to her nest and settled herself down quite oblivious to our presence. I could almost have reached up and touched the nest. The female, about the size of a canary, has the whole of her neck and throat coloured a metallic steel blue. The underparts of her body are white, the upperparts brown. Three minutes later the male appeared, resplendent in the typical long sweeping tail of the flycatcher. He came dipping in with much chirping and hullabaloo due to the presence of a Sunbird in the nesting tree which had overstepped its territory. These flycatchers are very territorial and the male became extremely aggressive to the poor sunbird, driving it off with a lot of noise and mock attacks. The female, aroused by all this activity, promptly left her nest to join in the persecution. I was led to another nest about a hundred yards distant where a pair of flycatchers were in the process of constructing a nest. This was perched precariously on a low branch only fifteen yards from a native house. After a wait of half an hour the female arrived and began working on her nest. The Paradise Flycatcher breeds just before the rains from October until March. The female does most of the incubation but both parents share the duty of feeding the young. My guide told me that only one egg was laid (Philippe Loustaunau in *Land Birds of the Granitic Islands* maintains that the clutch numbers three eggs). Confusion also exists concerning the incubation period. It has been stated as being both 12 days and one month. Obviously more work needs to be done.

The Seychelles Black Parrot (*Coracopsis barklyi*) is confined to Praslin, the second largest island in the group. It nests only in the coco-de-mer forest in the centre of the island but can be seen over a much wider area. It is the size of a starling. The plumage on the upper parts of the bird is sooty-brown, becoming lighter on the underparts, the same colour on the beak. This bird is extremely rare. It is not known for certain how many there are left, but estimates in the region of 60 birds have been given. Although this bird feeds mainly on berries and fruits outside the Vallée-de-Mai, it nests only in the Vallée among the huge fronds of the coco-de-mer, some of which are 15 ft. in diameter. Such a symbiotic relationship between a bird and its specialized environment must be unique. Since the parrot is found nowhere else but in the vicinity of these palms it is quite fair to assume that should its habitat be destroyed by fire for instance, which has been a common occurrence on some of the other islands, then the Black Parrot, so highly specialized, will be unable to adapt to a new environment and will cease to exist. Confirmation of this inability to adapt was given by the Director of the Botanic Garden, Mahé who told me that they had attempted to keep some Black Parrots





an aviary in the gardens. Although the climate is identical of course to that on Praslin, and the fruits provided for them the same as they would find in and around the Vallée-de-Mai, none of the birds survived. This believe was attempted on several occasions. Very little is known about the nesting habits of these birds but the clutch is said to contain at least two eggs and both parents are believed to take part in feeding the young. On the small sixty acre island of Cousin two miles from Praslin lives a little warbler known by the attractive local name of *Petit Merle des Iles* or Seychelles Brush Warbler (*Bebrornis seychellensis*). This small olive-green bird is the least striking of all the birds on the island which include the beautiful Fairy Tern, Tropic Birds and both Noddy and Sooty Terns. It is, however, one of the rarest birds in the world. There is no evidence to suggest that it ever inhabited any other island but Cousin—the short stretches of water between them being an insurmountable barrier for a bird with such a short fluttering flight. They were easy to observe since they had no fear of man and I noticed many youngsters sitting in the low branches frantically trying to attract the attention of their parents by waving their fluffy little wings rapidly. The breeding season proper lasts from October to March although David Lloyd, the present Scientific Administrator of the island, told me that he has seen them nesting at all times of the year. The nest itself is similar to that of the Paradise Flycatcher and is built of dry grass and strips of coconut fronds. It is placed at the fork of a low branch in bushes about six feet from the ground, frequently in a patch of mangroves. The clutch consists of whitish-coloured eggs spotted with brown. It is an entirely insectivorous bird, caterpillars and insects forming its diet.

Also found on Cousin as well as on Cousine, Marianne and Félicité is the very rare Seychelles Turtle Dove (*Streptopelia rostrata*). Both sexes are alike. The head and neck are a deep red as far as the chest and underparts where it becomes lighter. The back and wings are brown whilst the abdomen and underparts of the tail are greyish-white. The tail feathers are broadly banded and a pattern of small black spots is evident on either side of the neck. Unfortunately the true endemic species is becoming exceedingly scarce due to interbreeding with introduced species. The breeding season begins in late October and continues until March. In common with all doves the courting display is a pantomime of cooing and bowing followed by the female inserting her beak into the male's, more head bobbing and finally mounting. The nest is a small platform of dry twigs and roots placed in a low tree or bush about six feet from the ground. The male, like all good husbands, collects the building material and hands it to the female who places it in position for the nest. Nest-building, which seems to take place only in the mornings, lasts for about eight days. The clutch consists of two white eggs laid at 8 hour intervals, and incubation lasts for eighteen days. The chicks are fed by regurgitation and leave the nest four weeks after hatching.

Food of these birds consists of the seeds of local plants such as the Castor Oil plant and the Herbe Sargent.

Another endemic columbidae is the Dutch Pigeon (*Alectroena pulcherrima*) which is fortunately fairly well distributed over several of the islands in the granitic group including Mahé. It has a much more complex courtship display than the Turtle Dove, far too detailed to go into here. The site for the nest is chosen by the mated pair together, after searching numerous forked branches. When the chosen site has been established the male flies off to gather nesting material with which the female constructs her platform. During the incubation period which lasts for eighteen days and is shared by the male, the male sleeps by the nest at night, even after the chicks have hatched. The pigeon feeds on fruits of such trees as Cinnamon, Wild Fig, Guava, Bois de Pomme, and is especially partial to the flowers of the Rubber Tree. It is generally found in flocks of up to about fifty and seems to confine itself to the forests. In general appearance this bird is blue-black in colour with the neck, upper back and breast a pale grey.

There are two endemic birds of prey on the islands. One is a small Kestrel known as *Katiti* (*Falco area*). It is fairly common on Mahé and some of the other islands, inhabiting the rugged mountain slopes. It is also said to live in Churches and buildings around Victoria, the capital of Mahé. The only ones I saw were sitting forlornly in their cages at the Botanic Gardens. They are striking little birds measuring about 9 in. in length and are grey-brown in colour. Both sexes are identical. The breeding season is usually from November to March although they have been noted as breeding as early as September. One to two white eggs spotted with brown are laid in rock crevices on the mountain side or even on the top of bare walls. The incubation period is not known. The *Katiti* feeds mainly on lizards striking them down at a tremendous speed with its talons in the typical hawklike manner.

Much rarer and until recently thought to be extinct is the Bare-legged Scops Owl (*Gymnoscops insularis*) which is about the same size as the English Little Owl. The general colour is russet-brown with black streaks. It is known to live in the mountains above Anse aux Pins on Mahé. Unfortunately very little additional information is available: total numbers are as yet unknown, but quite obviously very few of them exist. Perhaps the plight of this small owl has something to do with the introduction, around 1950, of the African Barn Owl that has since spread to most of the outlying islands and is proving a serious threat to many of the endemic birds.

In 1906 the small attractive Seychelles White Eye (*Zosterops modestus*) was reported as being plentiful on Mahé. However, since 1936 there had been no record of its existence, at least not until very recently when a small flock was discovered at La Misere, Mahé. Virtually nothing

known about this extremely rare bird at present, only that it feeds on tiny insects and nectar.

Another bird that can share the title as one of the world's rarest birds is the *Pie Chanteuse* or Seychelles Magpie Robin (*Copsychus sechellarum*) of which there is reported to be one specimen on Alphonse island and approximately 30 on Frégate. This outstrips both the Black Parrot and the Seychelles Brush Warbler for rarity. The Magpie Robin is about the same size as a starling. Both sexes are metallic steel-blue in colour with white wing coverts. The tail is normally carried high over the back and is frequently lowered and jerked up again. The Magpie Robin appears to spend the hottest part of the day in the shade of trees emerging only in the cool of morning and evening. Its courtship display is interesting. It consists of the birds hopping to and fro on the ground as if searching for food. While doing this they closely watch each other. Finally one bird flies toward the other with its beak and neck held pointing up in the air. The wings are drooped, tail depressed and slightly fanned. In this position the male then lets out a low screech rocking its head from side to side. The female, by this time in the tree, has fluffed herself up into a ball, and makes short runs along the branch in front of her mate who eventually follows suit but does not puff up his feathers and retains a perpendicular posture of false indifference. The nest consists of strips of coconut leaf and small dry roots as well as feathers and any bits of likely material they can find. The clutch is said to consist of two white eggs, but no definite information is available regarding the incubation period. Food consists of insects and even lizards, which abound on the islands.

There are more birds on these granitic islands but almost all of them have been introduced, and to the casual observer they are noticeably void of any wildlife, with the exception of course of the ubiquitous Indian Mynahs. The outer islands, however, which are non-granitic, such as Bird Island, the Amaranties and the Aldabra group which I did not visit are incredibly rich in sea birds. It is heartening to know that many of the Seychelles islands are now nature reserves.

REFERENCES

- DOCTER, J. Conservation in the Seychelles.
 GUSTAU-LALANNE, P. 1962. Land Birds of the Granitic Islands of the Seychelles.
 EXIME FAYON. In, *Journal of the Seychelles Society*, Nov. 1971.

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NEWS FROM THE BERLIN ZOO

By PROF. DR. HEINZ-GEORG KLÖS

A very rare event is the hatching and raising in our Zoo of a Long-crested Eagle (*Lophoaëtus occipitalis*). Two eggs were laid at the beginning of January. One egg was left with the parents, the other one was put in an incubator. After an incubation period of 40 days, the two young hatched. Unfortunately the one we had left with the parents was found dead a few days later. The other one developed extremely well under the care of the keeper who has already raised Black Vultures (*Coragyps atratus*) and Andean Condors (*Vultur gryphus*) several times. It is unknown to us whether there has been any breeding success with these rare African birds of prey in other zoos and naturally we are very pleased with the unexpected event.

As in the past years the fine breeding pair of European Eagle-Owl (*Bubo bubo*) again pleased us with three grey and white "Easter chicks" which were hatched on 11th, 12th and 13th March. Now they have grown so much that they no longer fit under the feathers of their mother. Their appetite is very remarkable. Whereas they had been nursed by their parents during the first days, they now gulp down each its own portion of mice. These young will be given to a German Wildlife Preservation organization and from there set free in the Harz, Bayerische Wald, or other suitable areas of the Federal Republic of Germany.

In addition to these remarkable breeding successes so very early in the season, two Cape Barren Geese (*Cereopsis novaehollandiae*) and one Rock-dove (*Columba livia*) were hatched.

New to our collection of Birds of Paradise is a pair of Wilson's Bird of Paradise or Bareheaded little King (*Diphyllodes respublica*) and four young Greater Birds of Paradise (*Paradisea apoda*) still in their simple brown juvenile plumage.

* * *

NEWS AND VIEWS

The Collared Dove, once almost unknown in Britain, has spread across the country in such alarming numbers that farmers are pressing for it to be taken off the list of protected birds.

* * *

R.R.P. van der Mark, of Woerden, Holland had five pairs of Sambar Tragopans, hatched the previous year, housed together in 1971. When still in immature plumage these produced nine eggs. Six were fertile and a male and four females were reared.

Eugenio Callegari writes of his birds in 1971: "The only new success was with a pair of Tooth-billed Barbets which reared two healthy young. Some other birds including the Swallow-tailed Manakin, Amethyst Starling, Turquoise Jay, Ross's Touraco and Schalow's Touraco laid eggs which did not hatch. The male of a pair of Spotted Cotingas displayed but nothing more."

* * *

New Mutations. David West reports the establishment of lutino black-faced Lovebirds ("with pink face and buttercup yellow body") in California and Dr. L. Swaenepoel the existence of several lutino elegant Parrakeets in Belgium.

* * *

Paul E. Schneider of California writes "1971 was quite a successful year considering that my collection was moved to a new location and the weather was most erratic. For my own records I produced for the first time two Blue Rosella, six Princess of Wales and eight Elegant Parrakeets, one Citron-Crested and two Bare-eyed Cockatoos and two Arizona Bleeding-heart Doves. Five Rock Peplar Parrakeets were also reared, making it fifteen years in succession that I have been successful in these. A number of the old reliables failed to produce. I am looking forward to the 1972 breeding season with enthusiasm."

* * *

In a letter to the Editor of "Cage and Aviary Birds" W. A. Pope of Australia reports the successful breeding of the White-headed Nun (*Archura maja*). Three young were reared in 1970 in a small planted aviary which was also occupied by various Waxbills. A compact nest of dried grasses was constructed in a half-open box, and four eggs were laid which hatched fourteen days later. The young were fed by the parents (which ignored live food) on soaked millet and seeding grasses. They left the nest when they were nineteen days old but continued to be fed by the cock for almost another six weeks. They were light brown all over and did not attain adult plumage until they were twelve months old.

* * *

Mr. A. Flintoft of Issaquah, Washington has a pair of Grand Eclectus parrots which have occupied a cage 8 ft. x 4 ft. x 6 ft. for seven years. Although the female has laid as many as fifteen eggs a year none hatched in January of this year. The chick is being reared by its parents on a mixture of flower seed, corn on the cob, grapes, carrots and bread treated with a B-vitamin preparation. At 37 days the chick showed the first signs of being a cock by a trace of green emerging feathers.

An article from the "East African Standard" 26th January 1972 was recently received from Malcolm Ellis. It describes the breeding of Ross's Touraco in Nairobi in the private aviary of Henry Dale. It is not very informative but states that the nest of twigs was built by the female in a wire tray. The incubation period was 28 days and the chick was reared by the parents on fruit and insects. The account may represent the first recorded successful breeding of this magnificent indigo-blue, red-crested species.

* * *

Dr. Swaenepoel reports that colour-breeding of Greenfinches is becoming very popular on the Continent. The lutino is quite common and cinnamon and blue mutations are well on the way to being firmly established.

* * *

News from Flamingo Gardens, Olney, Bucks. C. Marler writes "The highlights in last years breeding results were as follows: three Trumpeter Swans, four Black Swans, 12 Emperor Geese, 19 Black Breasted Geese, six Black Spurwing Geese and six Red-breasted Geese. Young were also reared from many of the commoner species of waterfowl. Eggs were laid by Stanley, White-naped and Sarus cranes and by Andean Condors, King, White-backed and Black Vultures. The collection now contains all nine species and subspecies of Swans, totalling 74 individuals, 42 species and subspecies of Geese and 173 Flamingos of all six species.

* * *

John Yealland contributes the following: Memoirs of William Hickman Vol. 3 (1782-1790) published in 1925. Pp. 65-66 "On board this ship (Flamand) there was one of the most extraordinary birds I ever saw. It was a Mynah from the Island of Sumatra which sung a number of French and Malay songs, repeated verses and was an inimitable mimic. It likewise went regularly through the whole manoeuvre of putting a ship about, making such a noise as would have led one to suppose two persons were "singing out——".

* * *

D. H. S. Risdon sends further news from the Tropical Bird Garden, Rode. "New arrivals include Rothschild's Mynahs, Black-winged Andaman Mynahs, Black-collared Mynahs, a very tame and delightful young Pied Hornbill and a new Kea to replace one which died last year."

Our old hen Eclectus Parrot which had been with us for ten years has just died to my sorrow as she was a great pet—too much so because she refused to mate with the cock she lived with and all her eggs were infertile. Our Peacock-Pheasants started laying in the middle of February as usual and we have already collected second clutches. They lay almost exactly once a fortnight if you take away the eggs. The Carolina Ducks are all round the bungalow where we live, inspecting barrels in the trees. We tried two pairs of Roseate Cockatoos in one aviary in the hope that they would breed but not a bit of it. Within three days they were fighting. The mild winter has been kind to us birdwise, but I think there is more disease about in that sort of weather than in colder, drier conditions. We have had the big lake empty for over six weeks trying to get rid of some of the silted up mud. It has been an awful job for a lake surrounded by trees is not the easiest place to get at with machinery. However, the water is back in now but the bank looks a mess. We have tried to create a boggy part where the Flamingos can breed."

* * *

Aviculturists all over the world will be sorry to learn of the death, at the age of 79, of Mrs. Moon of Miami, Florida. For many years she was Curator of Miami's "Parrot Jungle" a great attraction to tourists where dozens of very tame, free-flying Macaws, Cockatoos and Parrots delighted visitors with their glorious plumage as well as the ability of many of them to perform a variety of tricks at the "Parrot Circus". Mrs. Moon will also be remembered for being mainly responsible for the establishment of the attractive White (Lutino or Albino?) Cockatiel which is now proving to be even more prolific than its normal counterpart.

J.R.H.

* * *

REVIEWS

FUNDAMENTALS OF ORNITHOLOGY. By JOSSELYN VAN TYNE and ANDREW J. BERGER. New York U.S.A.. Dover Publications 1971. Price £2.50.

This is an unabridged republication of the original (1959) edition which was begun by the late Josselyn Van Tyne and after his death in 1957 was completed by Andrew J. Berger in 1958. It is a practical and comprehensive guide which will be invaluable to anyone interested in the study of birds and although incorporating all significant previous work on the subject is both eminently readable and easy to use by the youthful bird watcher.

The first part of the book is devoted to general subjects essential to bird study such as palaeontology, anatomy, plumage and moult, sense and behaviour, voice and sound production, including a review of bird song studies, distribution, migration, flight, food and feeding habits, breeding behaviour, social relations, taxonomy and nomenclature. A final chapter on the classification of birds around the world contains descriptions in detail of representatives of each of the recognised 16 bird families.

At the end of each chapter there is a useful list of references which will enable the reader to consult the literature on the subject. The numerous figures help to explain the various anatomical features of birds, in addition to examples of each bird family. Finally there is a complete glossary up to date of ornithological terms.

We have no hesitation in recommending this work to anyone wishing to acquire a knowledge of fundamental ornithology.

E.H.

* * *

THE SWANS. By PETER SCOTT and the WILDFOWL TRUST. London: Michael Joseph, 1972. Price £4.20.

The beauty, grace and romantic mystery of these magnificent birds has attracted both writers and artists since the earliest times but this beautiful book is the first to deal comprehensively and scientifically with all the eight species of swans. Appropriately enough it is a combination of the work of artists and scientists, for Peter Scott has painted the frontispiece and drawn many of the line illustrations and in addition Philippa Scott and Ted Jackson are responsible for many of the 48 black and white plates, together with some of the world's best wildfowl photographers. The text, divided into nine chapters, is by Peter Scott who writes the introduction, and members of the Wildfowl Trust. The description of the species is by Hugh Boyd, followed by their distribution, migration and numbers by Malcolm Ogilvie. The habitat and food are described by Myrfyn Owen and Janet Kear; and Janet Kear also writes an account of reproduction and family life. John Beer and Malcolm Ogilvie write on disease and death; Andrew Dawnay on swans and man; Mary Evans and Andrew Dawnay on swans in art, heraldry and mythology and Geoffrey Matthews on their conservation. The whole is under the general editorship of George Atkinson-Willes.

There are a number of appendices including tables giving the weights and measurements of swans, clutch size and longevity, and also lists of recorded foods; and finally a comprehensive list of references.

We have nothing but admiration for this beautiful work but hope that in future editions it might be possible to include at least one example of a swan in dramatic art, following those in pictorial art.

E.H.

CORRESPONDENCE

RED-HEADED AND BLACK-HEADED BUNTINGS

There are some frightful old wives' tales in the world of aviculture, many of which have become clichés that are absolutely mandatory to some writers. Such reference to the literature that exists seems to be restricted to Alec Brooksbank's "Foreign Birds for Garden Aviaries" or last week's "Cage & Aviary Birds". Perhaps the most celebrated example is that of the well-known alleged fertile hybrid, the Bengalese. Only last year we were told in "Birds of the World" that the African Silverbill, Indian Silverbill, and the Pearl-headed Silverbill are all the same species—an extension of the erroneous belief that the African and Indian birds are conspecific. Indeed, the glee with which old saws like the Pekin Robin (not a robin and has no red breast, the Lazuli Bunting is Chaffinch-like (which it scarcely is), the Red-headed Bunting is not red-headed, etc. are trotted out, rarely for any purpose other than to undermine the credibility of the writer. The clichés seem to me to be repeated parrot fashion, without thought, and at times can even be misleading and hence dangerous.

Forgive my intemperate rant, please. It all began when I bought a Black-headed Bunting recently. The Red-headed I have owned on several occasions, but the Black-headed I am much less familiar with. I picked it out in a local pet shop from one of those ridiculous tall narrow cylindrical cages that seem to be designed with some abstract sense of modern decor design in mind. Should any species of bird ever be discovered that is only 2 in. long and can fly vertically, I imagine this cage would be ideal; until then, I recommend it for indoor plants only. The bunting was so covered with droppings from the birds on the perches above that its primaries and tail feathers looked like black and white cheese straws, and was quite incapable of flight. Furthermore, its back and rump were plucked quite naked. Despite this misfortune, the hapless creature was physically quite plump and was *muy gordo*, had a nice fat breast.

Following a very careful bath with my wife's most expensive toilet soap, and the care, the bird is now in excellent condition and singing freely. As I have watched him and studied him, I have also read the accounts of the species in the various books and journals that I have. Time and again I have come across the old cliché (with never any reference given) that some/many ornithologists consider the Black-headed Bunting to be conspecific with the Red-headed. Only the entry hints at the reason which appears to be because where the breeding range of the two birds overlaps a little, some hybridisation has been known to occur. This, of course, must be studied closely, but on the face of it that seems to me a bit shaky as a criteria on which to base such a sweeping statement. Indeed, viewing this as sole criteria, one could blithely sweep dozens of species off the books tomorrow, and wreak havoc in certain fields.

It is my own opinion that Black-headed and Red-headed Buntings are perfectly distinct species but I intend to do some careful study of them using as a model the history of the African and Indian Silverbill differentiation done by Dr. Brown (those interested please refer to *Ibis*, 106 (1964) : 462-468). Meanwhile, however, I would be most interested to hear from anybody who has kept both of both species, particularly if they were in the owner's possession at the same time. I for one would like to know the truth and the answer might well have application to modern ornithology or aviculture. In any event, though I hope if the cliché will die, they are part of the folklore and the entrenched old derivatives wouldn't have it any other way, I'm sure.

DE MANUEL MONTILLA 7,
COLONIA DE LOS PINARES,
MADRID 16, SPAIN.

ROBIN L. RESTALL.

SEXING PARROTS AND THE USE OF THE FOOT BY PARROTS WHEN FEEDING

I wrote my article on the use of the foot made by feeding parrots (AVICULTURAL MAGAZINE 1971 (77) pp. 93-100)—and simultaneously became interested in Caiques—as a consequence of, somewhat belatedly, reading a paper on “Head Scratching in the Psittaciformes” (Brereton & Immelmann 1962 *Ibis* (104) pp. 169-175). This contains some doubtful statements. One of which was to say that “the Loriniinae never hold food in the foot”—p. 174—and another which said that Caiques *Pionites* have few affinities with most South American Parrots—p. 172. Lories and Lorikeets do, of course, use the feet as hands. And Caiques are closely related to Conures (which is what Thompson—Brereton & Immelmann’s reference—wrote, and they misinterpreted).

Most of the evidence for my paper came from personal observation. Recognising that birds are individuals I tried to see as many of each species as I could. Where my number was limited, or absent, then I wrote to aviculturalists whom I thought might be able to help. The Geoffroy’s parrot *Geoffroyus geoffroyi*, and the Pesquet’s are individual birds owned by Mr. John Wilson, of Norwich. His Geoffroy’s parrot was seen to make an almost continual use of the foot as a hand when eating peanuts and apple. My observations of Keas came from a pair of captive birds at Bourton-on-the-Water and a single bird in the collection of the Zoological Society of London.

Since writing the article I have accumulated some further information—largely from my correspondence. Mr. Jackson, the authority on wild Keas, in New Zealand, says as does Mr. Forshaw, that Keas and Kakas often use the foot as a hand. Dr. James M. Dolan Jnr., of San Diego Zoological Garden, writes to say that both the Fig-parrots—*Opopsitta* and *Psittaculirostris*—use their feet when feeding as does, he goes on to say, the Greater Musschenbroek’s Lorikeet *Neopsittacus musschenbroekii major*. Watching my own Cockatiels gave me no surprise for I have found one Pied male, bred last year, who can—unlike any other Cockatiel that I’ve yet noticed—hold items in a free foot. And I was dogmatic to say that Cockatiels *never* use the foot as a hand!

I do not argue with what Dr. Parkes says of the two Amazons (*A. xantholora* and *A. albifrons*) except that if the two were to interbreed, as I suggested might happen, they do not necessarily have to produce an “intermediate specimen”. Indeed the offspring might look exactly like one or other of the parents and, from examining a skin, one could have no way of knowing that they were hybrids. For example, I hold that the White-bellied Caique *Pionites leucogaster* and the Black-headed Caique *P. melanocephala* are but geographical variants of the same species. They look superficially very distinct. Yet when crossed ♂ Black-headed to ♀ White-bellied instead of an “intermediate specimen” being thrown up the offspring looked absolutely indistinguishable from a “pure” White-bellied Caique—my personal observation of Mr. Frank Waite’s bird. Indeed Hooded Crows crossed with Carrion Crows produce chicks coloured as are the parents and not “intermediate specimens”. I remain sceptical partly from sheer pigheadedness but mostly because the proof of this pudding (i.e. are *A. xantholora* and *A. albifrons* the same species) could only be proved by experimentally hybridising the two and examining the offspring and backcrossing if necessary.

Arguing against my own recalcitrancy there are many parrot species that share the same range and do not interbreed. Yet in captivity cross with one another and the hybrid offspring seem perfectly fertile e.g. Red-fronted and Yellow-fronted New Zealand Parrakeets (*Cyanoramphus novaezelandiae* and *C. auriceps*); Alexandrine and Common Ringnecked Parrakeets (*Psittacula eupatria* and *P. krameri*) and various Australian Rosella parrakeets *Platyercus*.

My pair of Spectacled Amazons (*A. albifrons*) almost ceaselessly flick the head. This continuously directs attention to the face and the difference between the Yellow-lored (*A. xantholora*) and the Spectacled Amazon is largely confined to this region. This head-flicking might well be of value in avoiding confusion of identity—and so hybridising.

GEORGE A. SMITH

158, BROADWAY,
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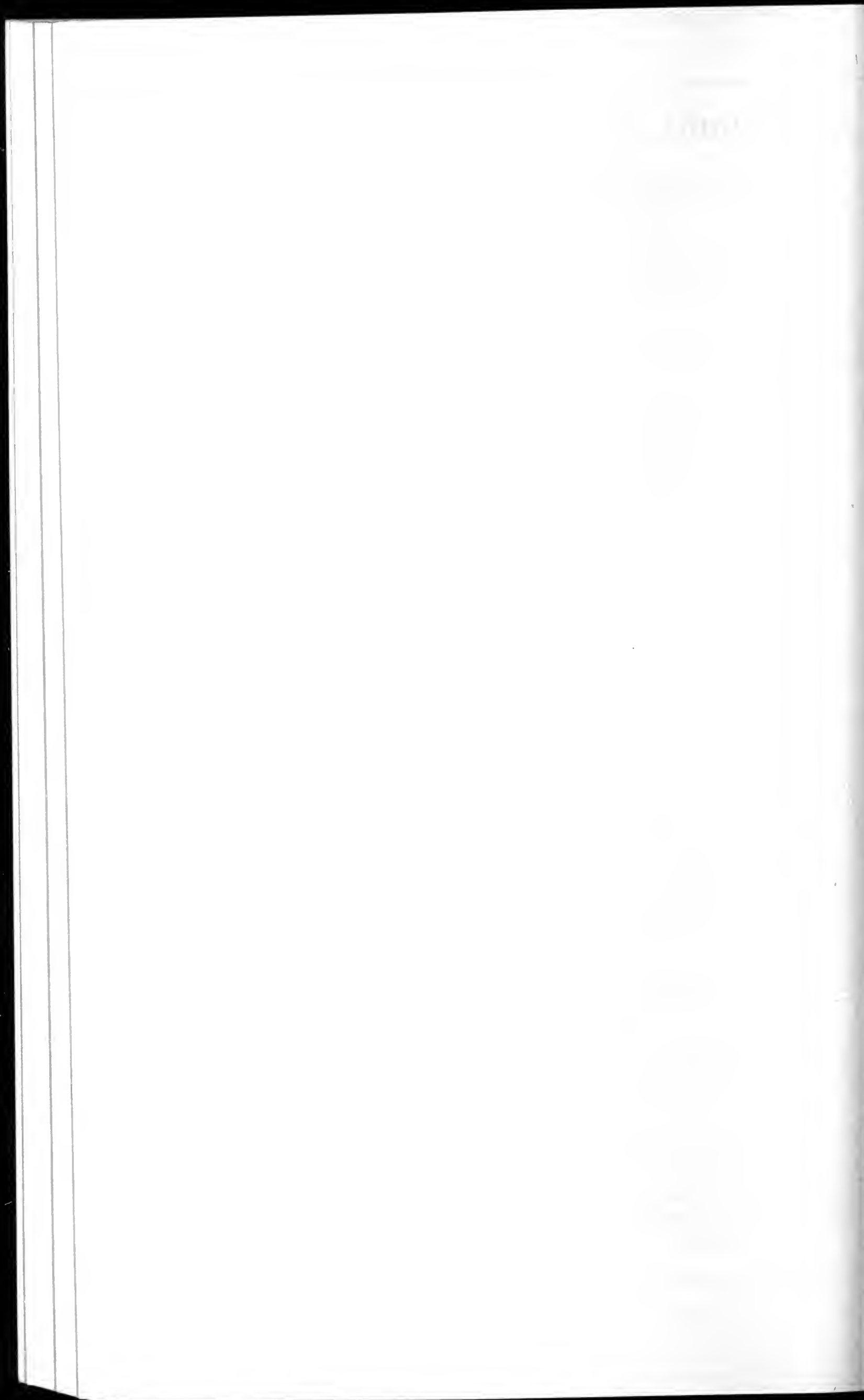
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The twenty-three Candidates for Membership in the March-April 1972 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

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(Colour Plate Fund)

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Will Members please donate their surplus books on birds to the Society
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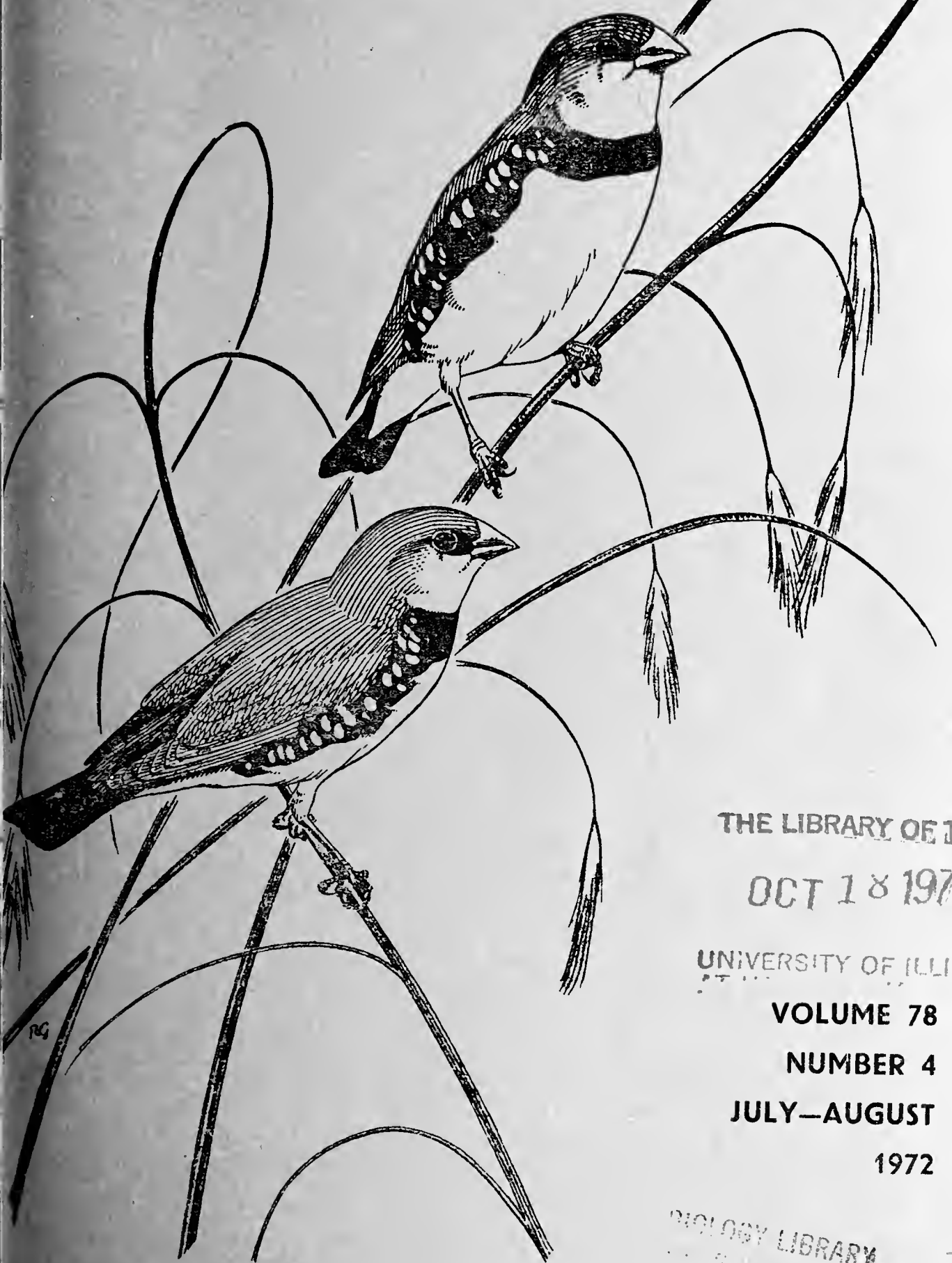
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THE AVICULTURAL SOCIETY

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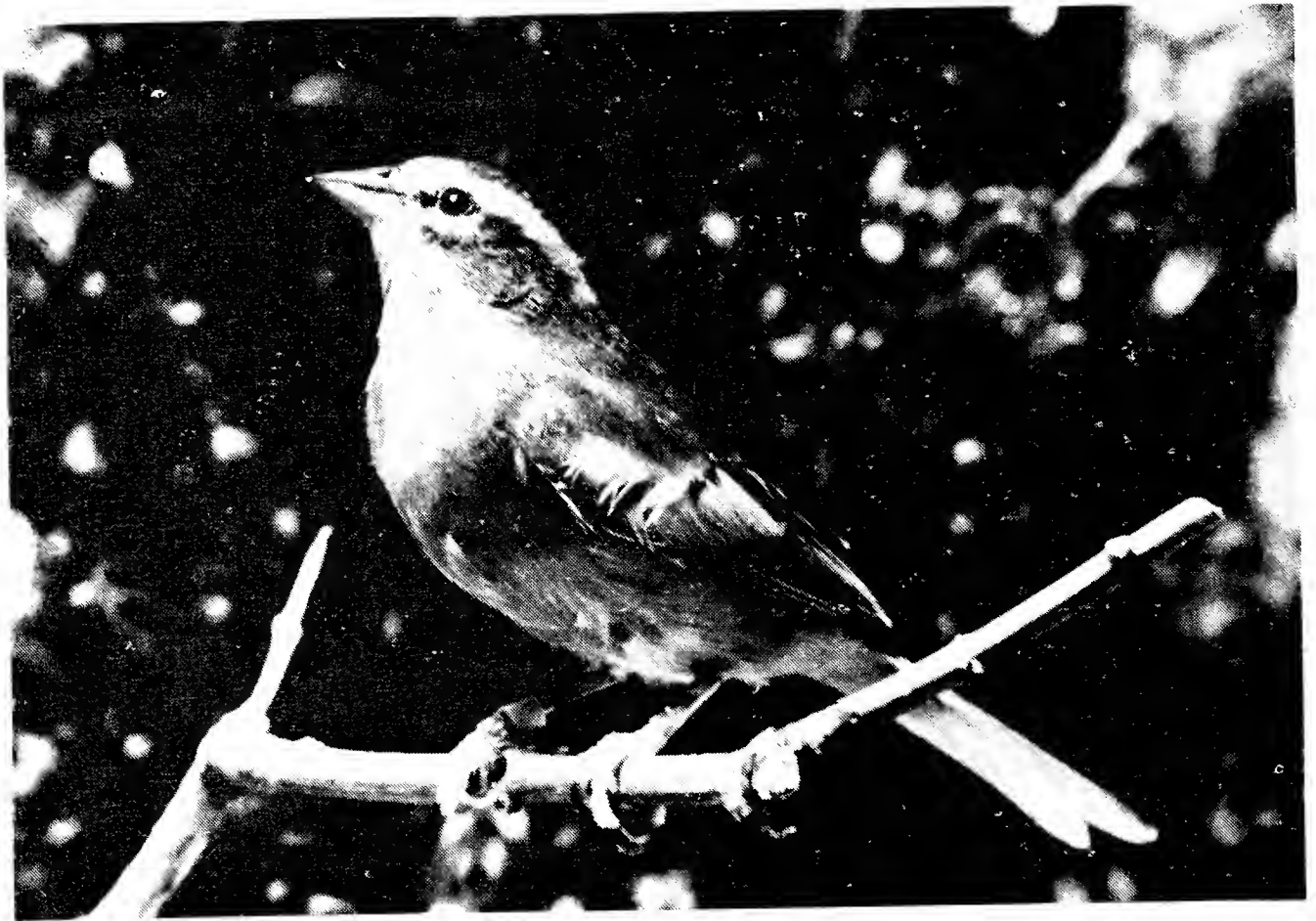
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Young Pretty Warbling Finch five days after leaving the nest.

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JULY-AUGUST 1972

REEDING OF *POOSPIZA ORNATA* IN SWEDEN

By RALPH ZACKRISSON (Gothenburg, Sweden)

In connection with a visit to a bird exhibition in Ystad in the autumn of 1969, I had a look in a pet shop in the little village of Kävlinge. In one of the cages there was a pair of birds which nobody was really able to identify. My interest in them was quickly aroused, although one of them was in rather bad condition. This made me hesitate, but after some consideration I made up my mind, took the chance and bought the two birds.

Later the same day I paid a visit to a friend in Smygehamn, the southernmost place in Sweden, and much to my surprise I found in his collection of other three birds of the same species as the pair I had already bought. My friend very kindly let me have his three specimens, so I was fortunate enough to bring home to Gothenburg no less than five birds of this still unknown species.

All of the birds, three males and two females, were put into a box-type cage, measuring $100 \times 70 \times 60$ cm ($40 \times 28 \times 24$ inches), which I always use for the acclimatization of new birds during their first weeks in my possession. One of the males was very ill and soon died, but the remaining four, an older and a younger pair, seemed fit and were subsequently released in an outdoor aviary, $3 \times 1.5 \times 1.8$ m. ($10 \times 5 \times 6$ feet), which they shared with other finches and waxbills.

During the spring of 1970 the two older birds started to build an open nest in a birch thicket, but it was never finished. Soon afterwards I had to go away for a couple of days, and on my return the female was dead. At post-mortem examination I found in her a soft-shelled egg, and so I concluded that egg-binding was the cause of her death. As far as breeding attempts are concerned, nothing else happened that year to my Pretty, or Cinnamon, Red-bellied Finches (*Poospiza ornata*) of northwestern Argentina. The question of their correct identification had now been settled, to a large

extent through help from some over-ambitious friends and their literature on birds.

Next spring, 1971, the younger male turned very aggressive towards the older male, so I found it advisable to remove the latter from the aviary they had hitherto shared. At the end of June my new bird-house with adjoining outdoor aviary was finally ready to be taken into use. Most of my birds were immediately released there, but not the Warbling Finches since the male had now begun to fly around with nesting material in his bill. However, some weeks passed without anything happening, while the birds in the outdoor aviary were thriving and had started nest-building. Thinking there was enough room in my new aviary for the Warbling Finches too, I decided to let them out into it as well. The bird-house measures $3 \times 3 \times 2$ m. ($10 \times 10 \times 7$ feet) and the outdoor aviary $5 \times 3 \times 2$ m. ($17 \times 10 \times 7$ feet), planted with two small but thick elms and furnished with some pine thickets and several branches.

This releasing was, however, one of the biggest mistakes I have made with my birds, because the male Warbling Finch quickly selected a territory in the aviary where he only accepted a pair of Grey-headed Social Weavers (*Pseudonigrita arnaudi*). He became especially aggressive towards a pair of Fawn-breasted Waxbills (*Estrilda paludicola*) and a female Violet-eared Waxbill (*Uraeginthus granatinus*). Their general body colours agree to some extent with those of the Warbling-finches, which might be the reason for the male's great aggression. Sometimes he even chased the above-mentioned birds inside the bird-house.

When the female soon started to build an open, cup-shaped nest in a pine thicket about 1.5 m. (5 feet) above the ground, it became obvious to me why nothing had come out of the male's earlier flying about with a single grass-blade in his bill. He only took part in the nest-building with an occasional grass-blade now and then, otherwise he just made inspections. The inner diameter of the nest measured 4.5 cm. (almost 2 inches), and was equally deep. Basically it was built of moss and grass-blades, lined with horse-hair. Regrettably I was never able to watch any display.

On July 5th the female was brooding three eggs, which were about 17×11 mm. in size, coloured whitish with irregular brown spots. I observed only the female sitting on the eggs, and she sat very well. The male now fed her rather often in the nest with a variety of insects. She left the nest only a few times a day in order to have some water, always followed by her mate, who twittered incessantly until she had returned to the nest again and recommenced brooding.

During this time he became more pugnacious than ever and also sang rather energetically, but ceased his singing as soon as the eggs hatched.

When feeding my birds in the evening of July 17th, the male Warbling Finch at once flew down on the ground, took some fresh ants' cocoons into his bill and then flew up to the nest, in order to feed the female. I thought but I was wrong. Instead the happy mother stood up in the nest to climb

way for the father to feed the young, which were right below her. Finally she had some food from her husband, too. So now the eggs had hatched, but I don't know exactly when it happened.

Later the same evening when the female left the nest I saw my chance and had a quick look down into it. There were three young ones, which I estimated to be a few days old. They were greyish in colour with grey down. I don't know exactly how long the brooding period had lasted, but it should have been some 12-13 days.

The food I supplied to my pair of Warbling Finches to rear their chicks consisted of fresh ants' cocoons, mealworms and soaked sponge-cake ad lib. When time allowed I also collected various other insects with a net. These insects were put into a plastic bag, which I kept in a freezer for a quarter of an hour. Then I thawed the insects and fed the birds with them. However, I found that the thawing time should last for at least half an hour.

Everything went well for a couple of days, but in the evening of the 19th I observed that one of the youngsters had been thrown out of the nest. So I went inside the aviary and on checking I found only one nestling left alive. After some searching the third young one was also found, thrown out and dead.

Now, what was the cause of the two youngsters having been thrown out of the nest? Had the male's feeding made them so replete with food that they had received no signs of response from them when he returned to feed them even more, therefore thinking that they were dead and consequently throwing them out? No, hardly! Instead I guess that the male didn't want to feed the chicks with the kinds of food that were offered him. What to do? Well, I started collecting spiders, which is a very time-consuming task. The spiders, however, turned out to be an extremely appreciated food, and soon the male almost completely refused to feed his progeny with anything else. Sometimes he also seemed to soak the food in water before feeding.

The remaining young one was about eight days old when for the first time I watched the female feeding it. She took some food out of the bill of the male and fed the young one. I also watched the female flying out of the nest with droppings in her beak. I am not quite sure, but I think I have seen the pair feeding on the droppings before.

I now had another look at the young Warbling Finch. It had just got its eyes open and a short little tail. The flight feathers had also started to grow. When inside the aviary the parents continuously gave their monotonous alarm call.

Suddenly the male started to show distressing signs of growing ill-health. He seemed as if he had got something in his throat. He sometimes ate considerable amounts of food in order, as it seemed, to swallow down something. Some days later he had become so ill that he no longer took part in the feeding of the nestling. Then I realized that the best thing I could

do was to catch him up and put him in a hospital cage. I treated him with terramycin, an antibiotic capable of curing several different diseases but this time it was of no help and the male Warbling Finch died within a couple of days.

I can add here that a young Grey-headed Social Weaver died in the same way. A post mortem of this youngster showed that it had died from gapeworm (*Syngamus trachealis*).

Back to the young Warbling Finch. It left the nest the day its father died and should by that time have been about twelve days of age. As it was still far from fully fledged and quite unable to fly, I put it back into the nest. The female, however, by calling at once persuaded it to leave the nest again.

The following days the chick spent perching closely to the nest without moving much, but the female still fed it. My helpful friends found in the literature an earlier report on the breeding of this species in England (Cummings 1960). In that case the young ones had left the nest equally early. Therefore I believe we must consider this early leaving of the nest of *Poospiza* youngsters as a normal habit. There is another species, the Jacarini Finch (*Volatinia jacarina*), from which I have bred repeatedly, which to my mind is rather similar to the Pretty Warbling Finch in several respects, e.g. nest-construction. Their young ones leave the nest just as early as equal those of the Warbling Finches and are the nest just as early as equal helpless during their first days outside the nest, too.

The female fed the young one with mealworms only during the first few days after its leaving the nest and she definitely refused to feed it with anything else. This made me somewhat worried, feeling such a diet must be too one-sided and nutritiously incorrect. However, the female solved the problem herself when, some days later, she recommenced feeding her progeny with all types of food offered.

At this time the hen had started to fly about with nesting material in her bill again, and she also made efforts to build new nests in some different spots of the aviary, but now there was no male to defend them against nest material thieves. Therefore all her nest-building was in vain. Why the other birds preferred hers to all the other nest material available I really cannot understand.

At the age of three weeks the young Warbling Finch had become independent, so I caught up the female and let her in to the older, single male. The two seemed to agree very well together and three weeks later they began to construct a nest. In this case, however, the female did not take the lead but instead the male did. The constructing went very slowly, resulting in an incomplete nest.

In the same aviary there was a pair of Violet-eared Waxbills. They had been kept together with the male Warbling Finch all spring and summer and there had never been any quarrel between them. But now the male apparently changed his temper all of a sudden, because one evening w

was about to feed my birds, the hen Waxbill had become rather badly injured. I immediately removed her, and fortunately she recovered very well. The male Violet-eared Waxbill, on the other hand, was never attacked. The attack on the female Waxbill indicates, however, that the aggression of the now dead male Warbling Finch during his breeding period was evidently not occasional. Rather it seems to be quite clear that they are aggressive only towards birds of colours similar to themselves.

The colour of immature Pretty Warbling Finches differs from that of adult birds by being more greyish brown. The superciliary line is white and the breast streaked greyish and white. Aged three weeks they start to change into adult colour.

The young one, which turned out to be a female, is at the present moment (mid. Feb., 1972) seven months old, in splendid condition and very coloured. It has also gone through a complete moult.

In conclusion it can be said that the young one healed from the sores caused by the trouble-making father. I would also like to recommend this species of Warbling Finch to any aviculturist having room enough to house them an aviary of their own.

REFERENCES

- For a detailed description of *Poospiza ornata*, see
 FORSTER, R. B. 1888. *Catalogue of the Birds in the British Museum* XII, 643.
- For a brief description of *Poospiza ornata*, see
 SCHAUENSEE, R. M. 1970. *A Guide to the Birds of South America*, 424-425.
 MINGIS, W. D. 1960. Breeding of the Pretty Warbling Finch. *Avicult. Mag.*, 66 : 171-172.

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BREEDING THE YELLOW-FRONTED KAKARIKI OR GOLDEN-HEADED PARAKEET

By P. ODERKERKEN (Germiston, Transvaal, S. Africa)

It can be seen from various magazines and advertisements that the Yellow-fronted Kakariki (*Cyanoramphus auriceps*) seems to be establishing itself in aviaries in Europe and Great Britain. Here in South Africa it is not quite as common, but is in great demand, because of its lively disposition and its being an excellent breeder.

It is overall a dark shade of green being lighter on the chest and below. The forehead has a thin stripe of red (usually wider in males than females). Above this is the yellow patch which extends to the crown area. A tinge of yellow can be seen behind the eye, but is inconspicuous in comparison to the Red-fronted (*C. novaezelandiae*), which has a crimson patch. There is also a crimson patch on either side of the rump (usually hidden by the wing). Primaries are dark blue and the under wing is grey with a white wing stripe as in Reoplemas. This stripe seems to be more prominent in the female. Iris is bright orange-red and the pupil black which dilates in courtship or excitement. Feet grey, upper and lower mandibles blue-grey with black tips. Female is generally smaller than male and has a smaller yellow front patch. Young birds slightly duller than parents, iris colour less prominent and the dark tips on the bill are lighter in colour.

These birds have long legs and scratch like poultry and therefore I think they require turf in their aviaries. If this is not available, the birds will tend to have long toe nails. They, as I have said, are very active and require a fairly large flight, although they seem to be quite active in a holding cage. The Kakariki is not an aggressive bird, but I would not put finches in the same aviary for breeding. Kakarikis are very curious birds and delight in destroying nests of smaller land working individuals.

Their calls are not offensive to the ear and usually consist of a "ah! ah! ah!" in repetition.

The pair are housed in a 12 ft. \times 7 ft. high \times 6 ft. wide aviary, of which half is a fully enclosed wooden shelter.

The birds are strong flyers and I feel can use a longer flight than goldfinches. The nest box 12 in. \times 6 in. \times 6 in. was placed in the shelter (at 45°) and the Kakarikis immediately began investigation. Another breeder is using cockatiel size nest-boxes and I feel the base is too large for them. His hen laid seven fertile eggs and when I inspected the young, he found three chicks and the four eggs were strewn about in the corners of the nest-box. I think the young tend to dislodge them and since the hen was with her hands full, with three hungry chicks, she has no time to consider the other eggs. My nest box being small, concentrates the movement so far all eggs have hatched.

The nest-box was filled with peat moss and wood shavings; from this, the female made a "bowl" for the eggs. Kakarikis are credited with laying large clutches, but my female has only had 5-6 eggs; all were fertile and reared to independence.

The incubation period is 18-21 days and in one clutch the first youngster appeared on the 2/1/72 and four young were seen on the 4/1/72. The fifth youngster hatched two days later and as can be imagined was much smaller and weaker than its companions, which had grown considerably. I therefore felt sure that this youngster was doomed, because it could not strive up against its companions to be fed. However my female is a very good mother and she must literally have had to move the other youngsters to feed the chick, which grew rapidly. On the 13/1/72 the eldest chick's eyes had opened and pin feathers had begun from most body areas.

Up to this time, all young when recently hatched had white down, which was rather wispy, but on the 17/1/72 all young had cast the white down and it was replaced by grey down which was of a woolly texture and must be warmer for the chicks. Iris colour at this stage is of a pale yellow-brown texture.

Unfortunately, I was away when the young left the nest-box and could not be sure of the dates.

Kakarikis are prolific breeders and will have three clutches (at least) per year, but I feel three is already weakening the hen, so I take out the nest boxes and give her a well earned rest.

Once the young are independent, you must separate the youngsters, if you want to continue successful breeding. I have seen the cock feeding the hen and was attempting to mount the female when an ambitious youngster knocked off the hen and begged for food.

The cock also seems to be slightly aggressive towards his offspring. After being out of the nest for two weeks the young are normally feeding themselves.

My birds are fed on a mixture of canary, niger, linseed, oats and sunflower—favourite being sunflower. Red apples, lettuce, italian spray millet, milk thistle and other seeding grasses are given daily. Brown bread and pro-nutro mixed with enough water to make the bread crumble and germinating seed (oats especially) are given as a rearing food and is greatly appreciated.

Yellow-fronted Kakarikis are hardy birds and will bath any time of the year. A large bowl is needed for bathing purposes and should be filled daily.

People seem to be of the opinion that Kakarikis are rather susceptible to diseases and have a high mortality (see G. A. Smith, p. 186, vol. 75, AVICULTURAL MAGAZINE); luckily I have had no trouble as yet, but since they are ground birds and like scratching, they are liable to pick up stale food or any virus in a dirty aviary, so I keep mine clean every week as well as

giving them a strong dose of terramycin in the drinking water every now and then. This checks any possible diseases at an early stage. I certainly recommend the keeping of Kakarikis as they are easy to keep and intelligent birds.

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SOME OBSERVATIONS ON RINGNECKED PARAKEETS

(*Psittacula krameri*)

By GEORGE A. SMITH (Peterborough, Northants, England)

INTRODUCTION

The "Red-billed parrots", to a large degree, share several behavioural and structural characteristics: as well as the possession of a red beak.*

Females are the dominant sex. (In Broadtailed parrots—*Platycercina*—males are usually more aggressive than females. In Neotropical parrots both sexes seem reasonably evenly matched).

Most of the "Red-bills" take three years before they assume adult plumage.

The sexes are of different appearance—that of immature males is identical to that of adult females. (In those exceptional Broadtails where there is a sexual dimorphism immatures look like "dulled" versions of their respective sexes).

The cocks often have an elaborate and prolonged courtship display in which the females play a "passive" part.

Most (all?) are non-territorial and often nest colonially.

Rain-bathing (*vide infra*) is shown by many. Water-bathing is usual. I believe that they do not sun-bathe. (Broadtails sun-bathe, water-bathe and do not rain-bathe. Cockatoos rain-bathe and do not water-bathe. Cockatoos, instead of bathing, seem to sit in the water and "souse" themselves; while doing so they do not flutter the wings or duck the head. Many Neotropical parrots rain-bathe, a few sun themselves—dozing with a cheek turned to the sun. Broadtails droop the wings, spread the tail and fluff the head when they sunbathe).

Quite a few "Red-billed parrots" are well-known to aviculturists: Eclectuses, Barrabands, Princess-of-Wales', Lovebirds, "Psittaculids", Kings.

Except for Lovebirds *Agapornis* (Dilger 1960)—which are, in any case, aberrant in many ways—and Hanging-parrots *Loriculus* (Buckley, 1960) little substantive seems to have been written about these parrots and the following is an attempt to collect some "facts" about Ringnecks.

*Lories/Lorikeets also have red bills, and some, very few, Neotropical parrots have their beaks, or part of their beaks, coloured a curious carmine-red, fruit-juice shade.

This past year I formed a small community of three pairs of adult ringnecks and a single, immature, year-old hen. They are housed in a twelve foot square by seven foot high, flight, overhung by a large flowering Japanese-cherry. An open-sided asbestos hut provides shelter for the food and sleeping birds.

The Ringnecks can be separately identified for they form "natural" pairs: two lutino hens, two adult green cocks (one of the original males was killed) and two normal green hens, and one of each of the "pairs" had the tail shortened with scissors.

The three nest-boxes are fastened to the outside of the wire along one side of the flight and are slightly less than three feet apart. The examination door of each box is opened from the outside, as is the feeding-hatch. Therefore I never need to enter the flight and disturb the bird.

DISTRIBUTION

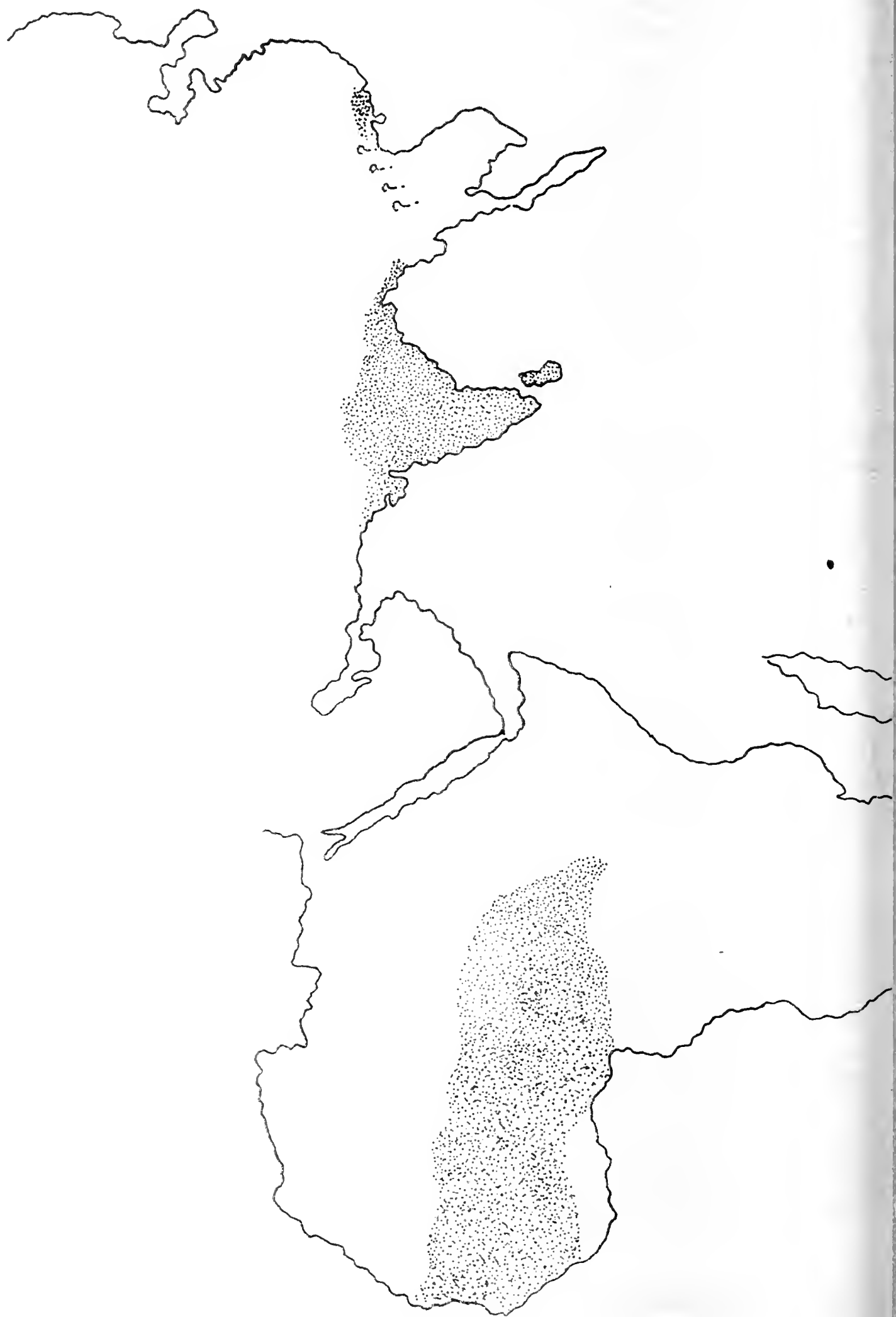
Ringnecks have the widest *lateral* range of any species of parrot: extending from the west coast of Africa, through India, to the south-east of China—more than 5,000 miles (fig. 1). The distribution seems to be determined by them showing a preference for "semi-arid country and open scrub" at low altitudes in Africa (Mackworth-Praed & Grant, 1970) and Burma (Smythies, 1953). Similarly in Ceylon where "it is a common bird throughout the low country dry zone, especially in the coastal districts, but it avoids the hills. In the wet zone it is scarce and sporadic" (Henry, 1955). In India, however, perhaps because extensive clearings and cultivation has taken place and allowed it to expand a previously more restricted geographical range, it "affects moist—and dry—deciduous forest type—even semidesert—keeping to light secondary jungle, gardens, orchards and cultivation in the neighbourhood of human habitations" (Ripley, 1969).

DESCRIPTION

Ringnecks are so common in captivity that I shall limit myself to saying they are beautifully tapered, yellowish-green parakeets of about the same body-size as a Starling *Sturnus vulgaris*—the long tail extending the same length to about fifteen inches. The bill is red, in both sexes—the tip of black which infiltrates the red of the lower and upper mandibles depending on different geographical areas. Adult males differ from females, and immatures, in that they have a black throat-stripe which is round towards the back of the neck and thins out on the sides and is bordered by a rose-pink band. The back of the head is powder-blue. Weight (average of ten wild-caught adults) 116 grams ($3\frac{3}{4}$ ozs.).

FEEDING

Most accounts of Ringnecks in the wild speak of what a nuisance they are to agriculture. My own seem, unlike most captive parrots, extremely



indiscriminate in what they find edible—grains, seeds, nuts, cooked and raw vegetables, seeding weeds, fruits, bread soaked in milk. When feeding they make frequent use of the feet to support food taken up by the bill. I have not seen them steady food by purposely standing on it. Two Ringnecks usually—though not invariably—a mated pair, can often be seen sharing a meal held in the foot of one of the birds. Though they spend some of the day searching and walking over the turfed floor I have yet to see them catch and eat earthworms and slugs as will some of the Broadtail parrots.

VOICE

The contact call, "Kee-ak" (Ali, *loc. cit*) is given far too repetitively to make them ideal aviary birds and is made both when flying and at rest. It is given most frequently when slightly disturbed, i.e. alert but not terrified and just before roosting at night. The warning note is a monosyllabic "Ak Ak Ak..." which brings incubating hens out of the nest and all Ringnecks within hearing tighten their plumage.

Immature males can sometimes be heard softly warbling to themselves. Adult males seem to relinquish this pretty practice for I have not heard it since they get a neck-ring. Adult males have a pleasant series of whistling notes when they are courting.

BEHAVIOUR

Although Ringnecks are very sociable it is noticeable that they seldom perch closer to one another than, say, six inches unless one of the birds is dozing. Indeed wide awake Ringnecks do not look completely relaxed unless a good foot of perch intervenes. They may accidentally brush against one another when engrossed in feeding; but having taken a portion of food they walk or fly a little way to eat slightly apart.

I believe that all six of my Ringnecks share the same sheltered perch at night. Which, if it is so, must compact them a little for it is only three feet long. There is another, seemingly, suitable perch which I doubt they use.

There is no mutual grooming between the sexes: as part of courtship cocks preen hens. I have never seen a hen preen a male although I have seen a hen preen a chick.

Females assume the highest position in the peck (social) order. Males, and young males in particular, are low in the ranks. Fighting is exceptional because the Ringnecks accept their non-egalitarian rankings—a show of force being taken as the real thing.

In captivity females sometimes murder other Ringnecks. The previous year, 1971, during the annual moult, one of the original hens developed a malformation of the upper beak. (Caused by the Scaley-faced mite *Nemidocptes pilae*). This odd-billed bird was suddenly attacked and killed by the dominant hen, which is a lutino, within less than three

seconds—for I tried to intervene. All the other Ringnecks clustered round in excitement but were, I think, not participants. In January of this year another adult, a male, was killed with a head bite when the Ringnecks were brought into a smallish indoor flight that they might escape frost-bite of the feet during the only three bad days of last winter. Some years previously I had asked a dealer to send me a Ringneck corpse—for anatomical purposes—He sent a dozen in one parcel, eleven of which were males, mature and immature: all bitten through the skull by other Ringnecks sometime during their crowded air-transit from India.

A large amount of their day is spent dozing fluffed out—often with the head twisted over onto the back—in a roosting attitude and with the eyes almost closed. Even in cold, short, days of winter little time seems to be spent in eating and most of the day, except when courting, will be spent languidly snoozing and occasionally preening.

I have sometimes seen an odd Ringneck, of either sex, turn the head away from myself—to hide the conspicuous red bill—when they know they are being watched, just as I have described for Malayan Longtails (Smith 1970). This behaviour is not general.

WATER-BATHING

I have not seen my Ringnecks bathe. Yet soaking-wet birds can sometimes be seen on the driest of days when the reduced level of the water bowl and the dripping surroundings indicate that bathing might have taken place. Twice I have seen one of my adult hens—not part of the colony—walking round and round the rim of her water (dog's drinking bowl) flicking her head in the water and slightly fluttering the wings. After four or five minutes she has flown away, without stepping into the water, looking perfectly dry except for a few splashes on the head and flanks.

RAIN-BATHING

Harrison (1961) has described this for Cockatiels *Nymphicus hollandicus* and for Blue-winged parrotlets *Forpus passerinus*. When rain starts to fall after a dry period Ringnecks become greatly animated, flying to-and-fro and, often, excitedly calling. Settling in exposed positions they open the wings and sit with them drooped loosely by their sides, the tail spread out, offering the maximum surface of the body to the rain and occasionally shaking the body like a wet dog. They will hang suspended from a twig or the roof-wire spreadeagled and then after half a minute or so fly off to settle and rub the head and neck on wet leaves and the perch. Their bedraggledness is intensified because they also hang sideways on into the rain soaking the flanks. A wettened Ringneck swishes the tail laterally and flutters the wings rather like a sexually excited Broadtail. They

sometimes sit wet and uncomfortable-looking in the rain until so wet that they have to seek shelter by crawling along the wire as if unable to fly with such a heavy, wet, unkempt plumage. Vigorous preening always follows rain-bathing.

BREEDING

I have diary notes for immature male Ringnecks showing some form of courtship activity over every month of the year—including June, July and early August when they are moulting. Paradoxically adult males rarely court from about early May until mid-autumn. I have been told that exceptional Ringnecks can breed in their first year. Year-old birds "play" their sexual roles; but, in my experience, they go no further. By the second year the majority of males are sufficiently sexually developed to breed though they will not get their neck-ring—and therefore look precisely like hens—until they moult in late summer. Some hens lay in their second year. I believe that most defer breeding till they are three years old. The non-breeding second-year hens will have accepted a mate, solicited for copulation, investigated and slept inside a nest box, etc. . . . MacDonald (1960), writing of wild Ringnecks, suggests that they may pair for life. It is noticeable with the birds in my captive colony that once breeding is over nothing is seemingly done between the members of a previously mated pair to "replenish" their pair-bond. There is no mutual preening, no feeding, no sharing of nest-box as dormitory, no sitting physically side-by-side—all of which are frequent in other parrots. On my observation at this time of the year—summer/early autumn—the pair-bond breaks down almost entirely and the birds seemingly become individuals within the broader group. During the moult I could detect "cohesiveness" between members of a former pair: except that when foraging they tended to be nearer one another than to other Ringnecks. Most of the early courtship-display—post moult—seems to be directed indiscriminately towards any hen—which, because there is some "habitual association", is most likely to be the previous partner. The "old" pairings are therefore not invariably re-established. As they flock in the field and may travel some way to feed I believe that the association between the two sexes would be easily broken in the wild when not breeding.

COURTSHIP

The circumspect courtship, by its avoidance of close physical contact, demonstrates the very real terror held by males towards females. The following descriptions are, of necessity, slightly generalised. I have tried to show that breeding is determined by the time of year and by so doing have largely ignored that, as said before, courtship by juveniles takes place any month of the year.

Males in the late autumn can be seen to sometimes walk in a slow, deliberate, stately way—the head held high and with blazing eyes.* The “iris rim” exposed by Eye-blazing is white slightly veined and streaked with blood vessels. Ringneck males also “fiddle” with the perch near their feet and then raise the head quite high—perhaps repeating this once or twice. Neither Bowing nor Stately-walking are protracted or pronounced. Both take place even when no hen is visible. Bowing is later “lost”.

By the early winter definite pair bonds can be made out as males increasingly “see off” their rivals. Near at hand they supplant by walking directly up to a rival male and lunging at them with an open beak and blazing eye. I have not seen males physically fight. The “gelling out” of definite pairs seem to be formed with the males preening the hens on the nape of their necks and the “butts” of the wings. They do not seem to preen elsewhere. Head-preening requires some co-operation from the hen. Whenever a male approaches a female there is always a large amount of Beak-wiping by the cock. Beak-wiping may diminish with increasing confidence but it never seems to subside completely.

In “Courtship-preening” which, except for hens sometimes preening their youngsters, is the only allo-preening observed, the male stands as far back from the hen as he can, by stretching to his maximum extent, just making contact with his beak. One almost expects him to tipple over (fig. 2b). His wings are raised slightly away from the body ready, it seems to surge him into instant flight if she should prove unresponsive. And yet to emphasize his boldness, he Eye-blazes. Females move little, if at all during this. If they but flinch the cautious cocks fly off a little way and then, courage returning, start again. Even with the hen compliantly quiescent the few swift, craning, caresses with the bill are so hastily performed that they resemble pecking kisses. Following such a Pecking preen the male pulls head back and raises it high with the bill tucked in tight against his stretched neck. The retraction of his head is so pronounced that the leg nearest to her is lifted high in the air: perhaps enabling the body to move back just that little further (fig. 2a). A momentary pause and then the head shoots forwards, preceded by a few shuddering taps of the uplifted foot on the perch, or in the air, to preen the hen once more.

Every so often some relief to his seeming tension is given by his taking one or two retreating steps backwards, wiping or tapping his bill on the intervening perch. (Bill-wiping in Ringnecks is partly stylised to become perch-tapping). Then he will step forwards to continue his Pecking preens.

*Eye-blazing means that the pupil is constricted to a pin-point by expanding the iris to its maximum extent bringing the outermost edge of the iris—normally concealed by the eyelids and sclera—into view. The outer part of the iris is often brighter than the usually seen inner portion. Eye-blazing is a common threat-behaviour in many, many parrots.

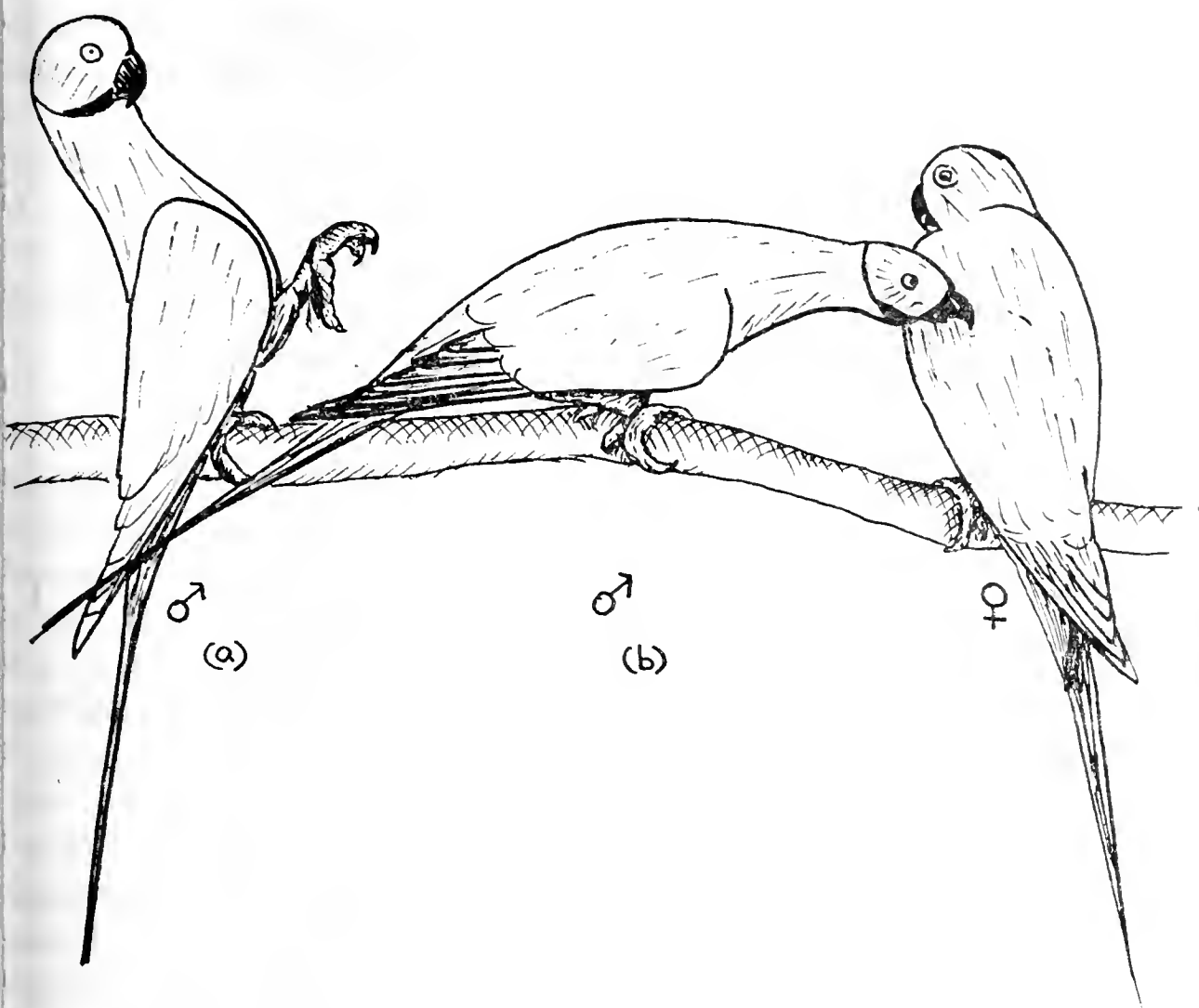


Fig. 2. 'Saluting' and 'Stretch-preening'.

preening ultimately leads to, and is interspersed with, bouts of courtship feeding. This, generally, starts out in very late autumn and early winter. The birds flatten themselves further onto the perch than when they have been stretch-preened. The hen pulls her head well into the body and twists it to one side. Regurgitatory Head-bobbing, that is vomiting up food from the crop by the male jerking his head up and down, is not obvious. However, following this Bill-knocking/Bill-wiping and raising of his head, just preceding making contact with the two beaks, there is a momentary pause, a slight, almost imperceptible halt. During this fractional pause, a slight puff of the throat, a slight crick of the neck is seen, as the food is brought up into his bill. The male's head has to twist slightly as he presents his offering to the twisted head of the hen. (Bill approach is head-on and not as described for Caiques and Conures (Smith, 1971) where the male physically seems to clasp onto the top of the female's bill at right angles.) The springing back of the head and the foot-raising—"Saluting"—are also part of courtship-feeding. This pull back of the head looks most as if the two heads were connected by a stretching elastic band. The relatively slow pull back of the head, with the Saluting, and then the sudden, snake-like, dart forward as the imaginary stretched elastic contracts the heads together.

Males also Stately-walk and give stiff little jumps when on flat surface—the ground and the food tray. I have not seen them Jump when walking along perches.

In a few more weeks—early and mid-winter, the female puts her body absolutely flat on the perch, back horizontal, and the wings slightly away from the body. The male by this point is moving closer when preening and feeding—and he seems to preen more than he feeds. The hen still keeps her head screwed up close to the body with the head askew.

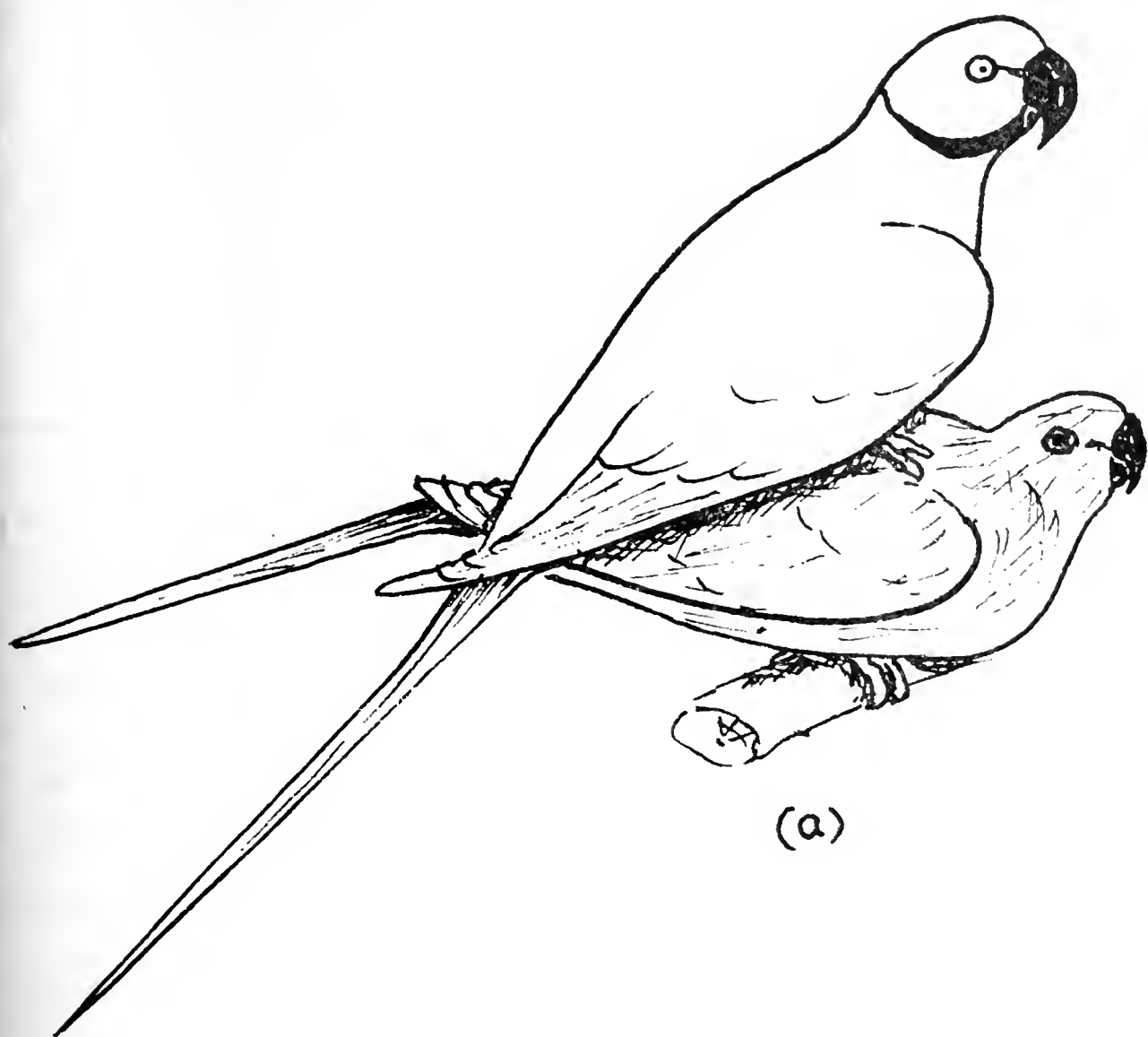
COPULATION

After a while the male attempts to stand on her back but this takes many fits and starts. For as he mounts the female he soon steps off. Eventually, and by many “practice” attempts, he preens the hen’s nape rather brusquely. Then, as she cowers the body submissively—they are now standing absolutely adjacent, bodies touching—he gingerly steps a foot on her back and stands on with *both* feet. The male has drooped wings and Eye-blazes. Preening becomes ritualised into a “hammering” on the base of her neck. “Hammering” because the male’s head is lifted high (Fig. 3a) beak tucked in, and then repeatedly “pounded” onto the back of the hen (Fig. 3b) just as if he were trying to knock a nail through the base of her neck using the “top” of the bill (culmen) as a hammer. Hammering is a very rhythmical tattoo and the rate gradually increases from about one “blow” in $1\frac{1}{2}$ seconds to a crescendo of more than one per second during which more rapid rate, the tail is lowered and copulation takes place. No changing of sides takes place during copulation as with Lovebirds (Dilger, 1960). After pairing—Hammering and copulation take about four minutes—both birds shake their feathers and preen. The male will then sometimes feed the hen.

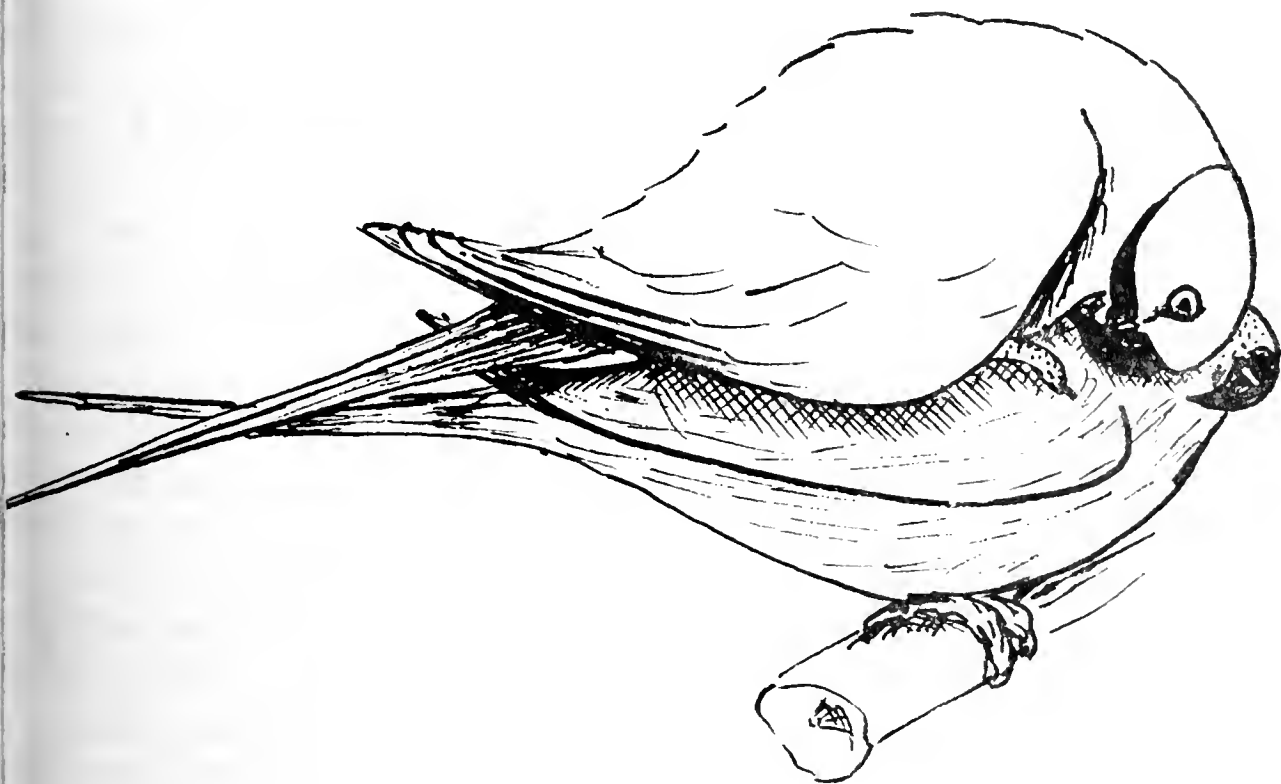
Copulation seems to stop about half-way through incubation and is resumed. Feeding of the hen by the cock continues until after the chicks are weaned.

All aspects of courtship are repeated persistently throughout the day. MacDonald (*loc. cit.*) says that, for example, copulation may take place “at hourly intervals”.

An extreme tolerance is shown when courting, as they seldom interfere with one another. However a soliciting hen can stimulate sexual adventure in another male. A feral Ringneck had been visiting aviaries since the middle of October. This wild male courted “Short-tailed Green” who had no mate, and fed her through the wire. The attraction was mutual and she used to come over to him. Eventually she put herself into a copulatory posture which attracted one of the tame already paired-off, males sharing the flight. This potential bigamy he tried to copulate with her but she drove him away. Nevertheless he persisted and began to supplant the wild male—her “true spouse”—flying onto the wire and frightening him off. The short-tailed



(a)



(b)

Fig. 3. 'Hammering', see text.

annoyed by this would then climb up the wire to where the "potential bigamist" was now clinging and lunge at him driving him away. Females are the dominant sex. This "sticking up for" her feral husband did not last and after a few days she accepted the bigamist as her mate. Neither of the two bigamist wives interfered in any way with one another nor seemed annoyed by their husband's flirtatious behaviour. Bigamist male divided his loyalties fairly evenly between the two wives. When the male nested he would enter one box and when the hen came out he would feed her. After she had gone back into the box he would sidle along the two foot of wire separating the next wife's box, enter that and then feed her. The feral male disappeared about a week after the hens started laying.

About the time that hens solicit—mid-January—they are seen, even increasingly, searching for nest sites on the ground—I do not hang up my boxes till early March. Like a Blackbird searching for worms the hens pick up and fling to one side all leaves and loose litter that lie in their path. And they start to dig holes in the turf of the aviary floor. Minimal work is done with the bill. Large objects—roots and fibrous portions of turf—are chopped and violently hauled out and thrown to one side—slightly backwards in projection but never over the back. Looser material is kicked backwards with strong scrapes of one leg followed by scrapes of the other. Aviary woodwork and the perches—which till then were little attacked—were chewed by the hens peeling and tearing off large splinters.

I put up my three boxes on the fourth of March. The three mature hens showed an immediate interest. The males (quite unlike Broadtail parrots, Cockatoos and Neotropical parrots) showed no obvious interest in the boxes. Dilger (*loc cit*) says (p. 667) of Lovebirds that "the female in particular investigates entrance holes. The male remains close to the female throughout these activities but his interest seems to be in her and not particularly in the nest site". This seems perfectly to apply to Ringnecks.

The hens first examine the entrance holes by craning the neck forward and peering inside and then pulling the head back just like a courting male feeding a hen—the usual Ringneck behaviour when investigating a potentially hostile object. Within less than an hour the hens had entered and started chewing within. The three hens slept inside their boxes from the first night. MacDonald records (p. 48) that wild females never sleep inside their nest cavities from July onwards. The male does not seem to help in excavating the nest chamber. Hens always fan the tail out when entering the box in the early stages: this practice later was not repeated. Males Crane-peer at the entrance hole just like hens. Hens keep other hens away from their nesting holes. Usually nothing more than a stare at another hen is enough to drive her away. Sometimes the interloper may be mildly pursued—mildly, for as the two birds fly away from the hole the object of sending the other bird off has been achieved and the chase is immediately stopped with the owner going straight back inside. Two

the first day, but never again, I saw fights in which both hens fell to the ground in a maul. They soon separated and the "rightful" possessor is always victorious.

It must be something about sleeping, or spending long times in the boxes that make hens ovulate. On the 21st March, sixteen days from the setting up of the boxes, two hens laid. The third hen laid the following day.

The eggs were laid on alternate days, were white, roundish, and averaged 8.7 grams in weight (twelve eggs). The dominant hen—the first—laid five, the next in the peck-order—the first of the Bigamist's—four; and the Bigamist's second wife—the lowest ranking hen—three. Incubation seems to have begun with the first egg. However, because previous to laying females spend most of their day inside the boxes it is difficult to determine. Males often were seen to go inside the box with the hen. Five to ten seconds afterwards both birds would emerge—the hen first. She usually defaecated, shook herself and then would be followed by the male. Sometimes cocks spent longer periods—up to half an hour—in the box with the hen. The feeding pattern is slightly less obtrusive during incubation and especially once the chicks hatch. The chicks now feed directly. The wings are not held away from the body. The two birds stand almost, though never actually, in contact and slight regurgitatory jerking of the head is seen—from the back view almost a wringing of the body. The often repeated Bill-wiping—between exchanges of food—probably also serves to aid regurgitation. The pumping movement seen during the actual exchange of food is created by the hen flexing her bill. The near-side foot of the cock is not raised but may be shuffled slightly or with some males kept fixed on the perch, during food raising. Overall the impression gained is that they seem far more at ease in one another's company. Sometimes both birds pull the head back after food has been passed so that the female's movements almost exactly duplicate those of males. A hen when receiving food always holds her head screwed to one side.

The male mated to the dominant hen slept inside the box at night with her once she had been incubating a week. The other male—Bigamist—remained in the shelter along with the immature female.

Male Ringnecks, if they can be said to be territorial, defend, and that slightly, the area around the person of their mate and fledged chicks, not the nest hole. The immature, unmated hen was often seen sitting inside one or other of the nest boxes and often sat chewing the wood of the sides. Neither male took any notice of this. Males, when the hens are incubating, or brooding, spend some of their day lounging on the perch immediately outside the nest hole containing their wife. Sometimes the "wrong" male sat on such a perch and the rightful male occasionally might drive it off by supplanting, or more generally would sit there unconcernedly some foot or so away. This is not so for hens;

they tolerate no other Ringneck, other than their husband, less than a foot from the nest hole or person.

My boxes are hung on a slope, the horizontal bottom of the box is bare wooden concave, and the slope down to the "concave" is laddered with $\frac{1}{2}$ in. square nailed laths. The hen Ringnecks chewed $1\frac{1}{2}$ in. to 2 in. long splinters from the steps to line the bottom of the box. These splinters plus a few down feathers were shaped into a definite nest and not just idly scattered. Among the nest material in two of the boxes were twenty or so husks from Sunflower seeds carried inside by the hen birds. I do not know how they carried them—in the bill or in their feathers like Lovebirds.

One hen was considerably more nervous than the others and she would bring the other two incubating hens off their eggs by her alarm call whenever she heard a strange or disturbing noise. The other two hens would, after giving the "annoyance"—usually me—a quick look hasten back onto their eggs. The nervous hen never went back until "danger" had passed.

The eggs took 26 days to hatch. The telescoping of incubating time that occurs with eggs about the point of hatching brought some late laid eggs forward in hatching time and delayed the hatching of some early laid eggs. Actual figures for 10 eggs—two were addled—each indelibly marked as laid and examined each morning at 8-30, were; One hatched after 28 days; two hatched at 27 days—these three were the first eggs laid. Six hatched at 26 days and one—the last egg laid of that clutch—25 days.

The three chicks—all hatched on the same day—of Bigamist's first wife mysteriously disappeared on the second day of hatching. The first hatched chick of the four of the "second wife" died when two days old. The lutino "Boss" hen mated to a "split" lutino/"split" light-green cock had two addled eggs, two lutino chicks and one light green. The chicks were weighed at 8-30 a.m. on one or two day intervals. Because there is absolutely no demand for "normals"—imported Ringnecks fetch a Pound wholesale—I substituted the Lutino's clutch for the normal chicks when they were a fortnight old. Killing the normal chicks with chloroform. Neither of the two pairs that lost their chicks re-nested. On the day that the chicks disappeared the hens roosted inside the shelves and not in their nest boxes. Courtship was not resumed. The hens started chewing the insides of the nest boxes once again and within a week had resumed roosting in them. Yet they never solicited again for copulation. The males fed them less and less and after a fortnight or so courtship practice stopped. Each pair still perched near one another during the day, very often sitting adjacent to their nest boxes. They did not interfere, with, nor show any interest in, the chicks in the third nest-box. By six weeks the pair-bond had almost disappeared.

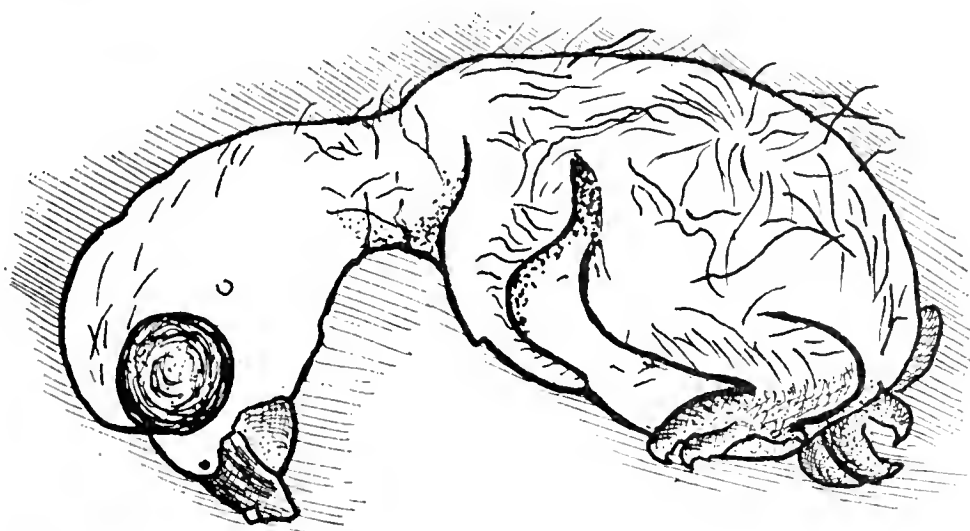


Fig. 4. Malayan Long-tailed Parakeet, day old. (*Psittacula longicaudata*.)



Fig. 5. Day-old chick Ring-necked Parakeet (*P. krameri*). Showing 'stubby down' compared with above.

CHICKS

The newly-hatched chicks (fig. 5) seem bare: close observation shows them to be "bristly" with a scattering of a very few, very short (1 or 2 mm.) white "hairs". Mr Ray Kyme kindly gave me an unhatched ringneck egg containing a nearly fully developed dead chick and this too had the same short "stubby" down. (Budgerigars *Melopsittacus undulatus* (*pers. ob.*) are born with similar extremely short "stubby" down, though they sometimes have an odd wisp of longer down. Budgerigars, however, are quite "hairy" in the egg and the down must be shed during, or shortly before, hatching). The few "bristles" of the Ringneck chicks are abraded and lost after three or four days leaving the chicks absolutely naked. Malayan Longtailed parrakeet chicks *P. longicaudata* (fig. 4) are generically akin yet they are thinly clothed with rather long white "hairs".

A graph of the growth of the six chicks is shown in Fig. 6. The males might grow faster than females. This is partly substantiated by the three

normal chicks that I killed and subsequently sexed. Also by the light-green chick, which is a female, for this character is a sex-linked "factor" in Ringnecks. If my inference is correct then a male chick is half as heavy again—for the same age—as a hen chick for the first three weeks of life. If conditions are adverse for growing—shortage of food, chilling due to absence of parents while foraging, then the bigger chicks—male chicks—would be less likely to die than the smaller, for the same age, female chicks. If there is this differential growth of the two sexes it may help in explaining why it is that male Ringnecks (and other *Psittacula* parakeets) seem always to be more common than hens—even when captured as immatures—and therefore are unsexable.

When the chicks are five days old many grey dots can be made out under the skin of the back. These are the developing down-follicles, for a fluffy down soon grows on the back, irrupting before the true feathers form as "pins".

When the chicks reached ten days old the parent hens spent some time away from the box feeding. Before this they barely left them. At ten days the chicks were about three times the hatching weight and the eyes just opening. The biggest chick was rung when eleven days old (size B12 ring). Its "sisters" were not large enough until they were fourteen days old. Chicks grow rapidly in weight largely from the accumulation of fat. The feathers over the shoulder-blades began to emerge from the pins when four weeks old. The maximum weight is reached when six weeks old and until they fledge at eight weeks they gradually lose some of this surplus weight of fat.

The bills are red—after a straw-coloured start—and the juvenile beak has the same outline of the adults. (Broadtails and the Australian "Red billed parrots" have an arrow-shaped tip to the bill, (see Cooper, 1968)).

The nest boxes remained dry despite the rather moist faeces. No attempt was made to scratch out the accumulated litter. Both cock and hen fed the babies. The male usually fed the hen outside the box and then would fly to the next-hole, enter and feed the chicks, often immediately followed by the hen. The hen brooded the chicks each night till they left the box. From ten days of hatching the amount of day-time brooding became less and less, so that by three weeks she barely brooded them at all. The alarm set up by their mother whenever I fed the parents caused the babies to "buzz" away in the box. Handling the chicks caused them to make a harsher, further-carrying sound.

They were six weeks old before I caught them peering out of the nest-hole and the first chick left home when two days short of being eight weeks old.

The other Ringnecks were greatly excited by its emergence and wanted to attack it. The parents successfully drove them off; but it took almost a week before each chick learnt to keep away from the nest-boxes of the

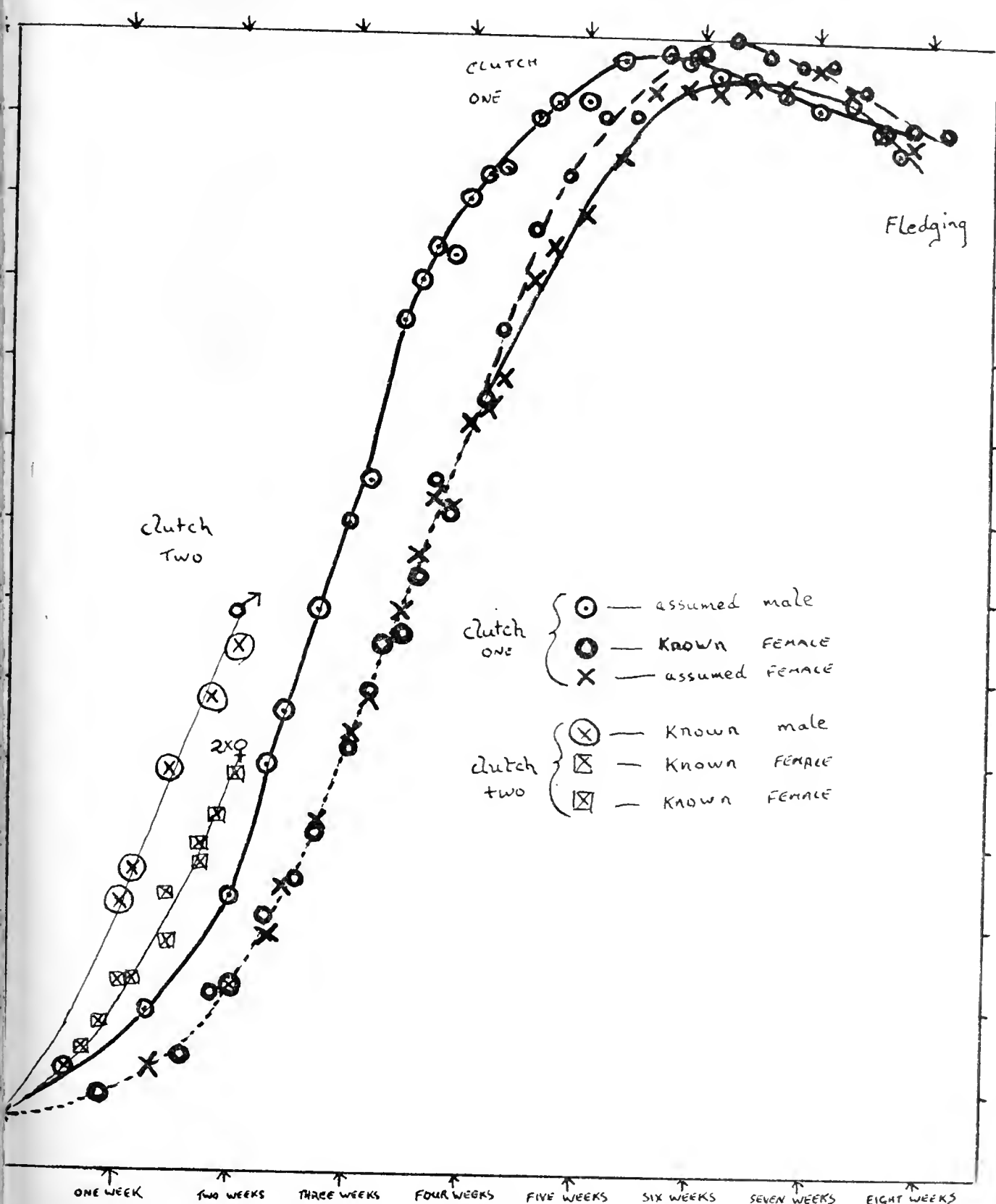


Fig. 6. Graph showing growth of six chicks from two nests.

er two hens—where attack was most severe. By two weeks they were picking seed and by three weeks were almost independent.

NODDING

The Bigamist's second wife, before he "took her over", used to competitively call with a particular strident note. At each note the tail flared and closed and between each bout of calls she would head flick. Interspersed with these strident notes—which are in the same "category" as the contact call, but clearer—she would utter a disyllabic call

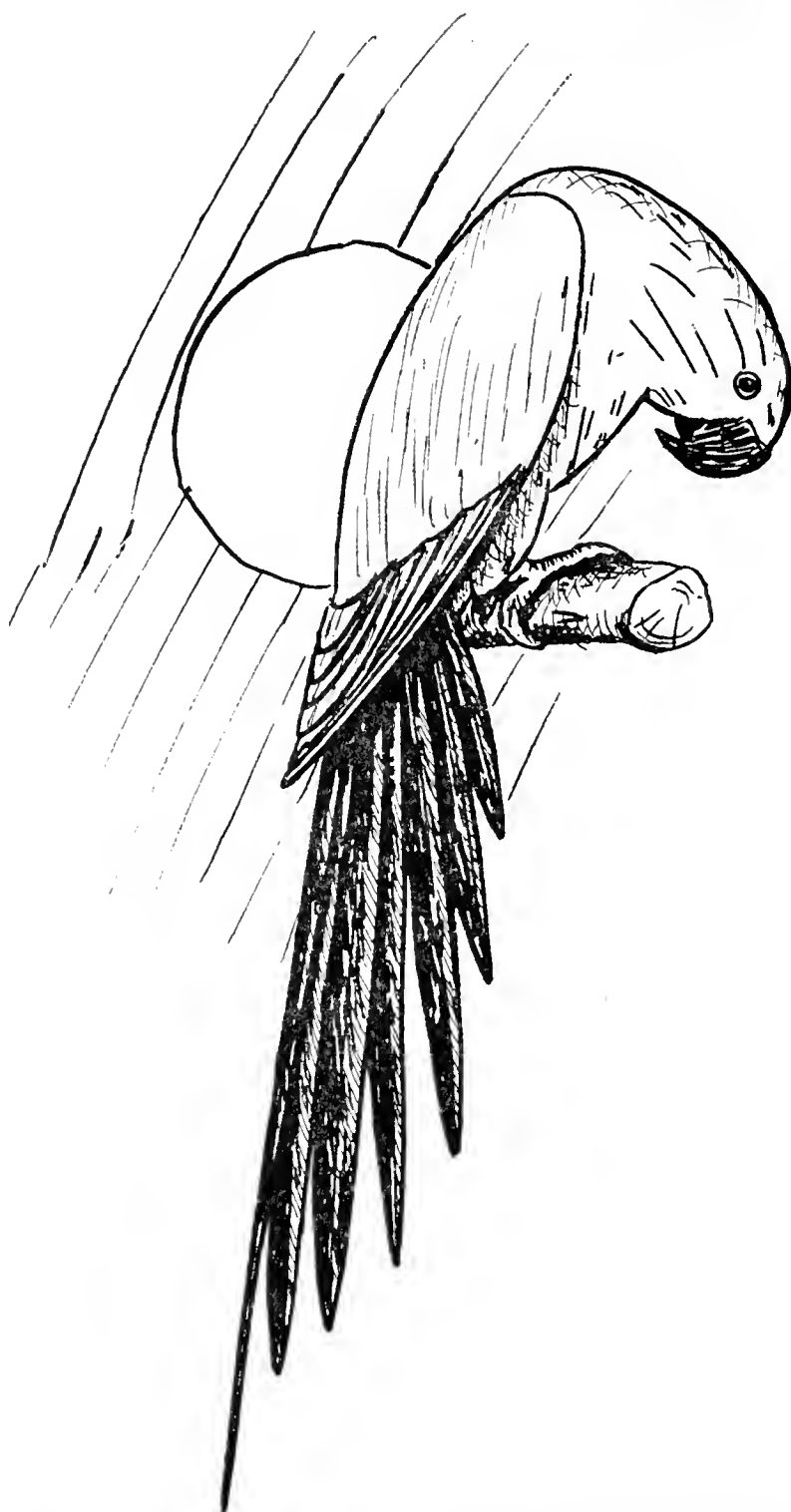


Fig. 7. Hen Ringneck 'nodding' outside nest hole.

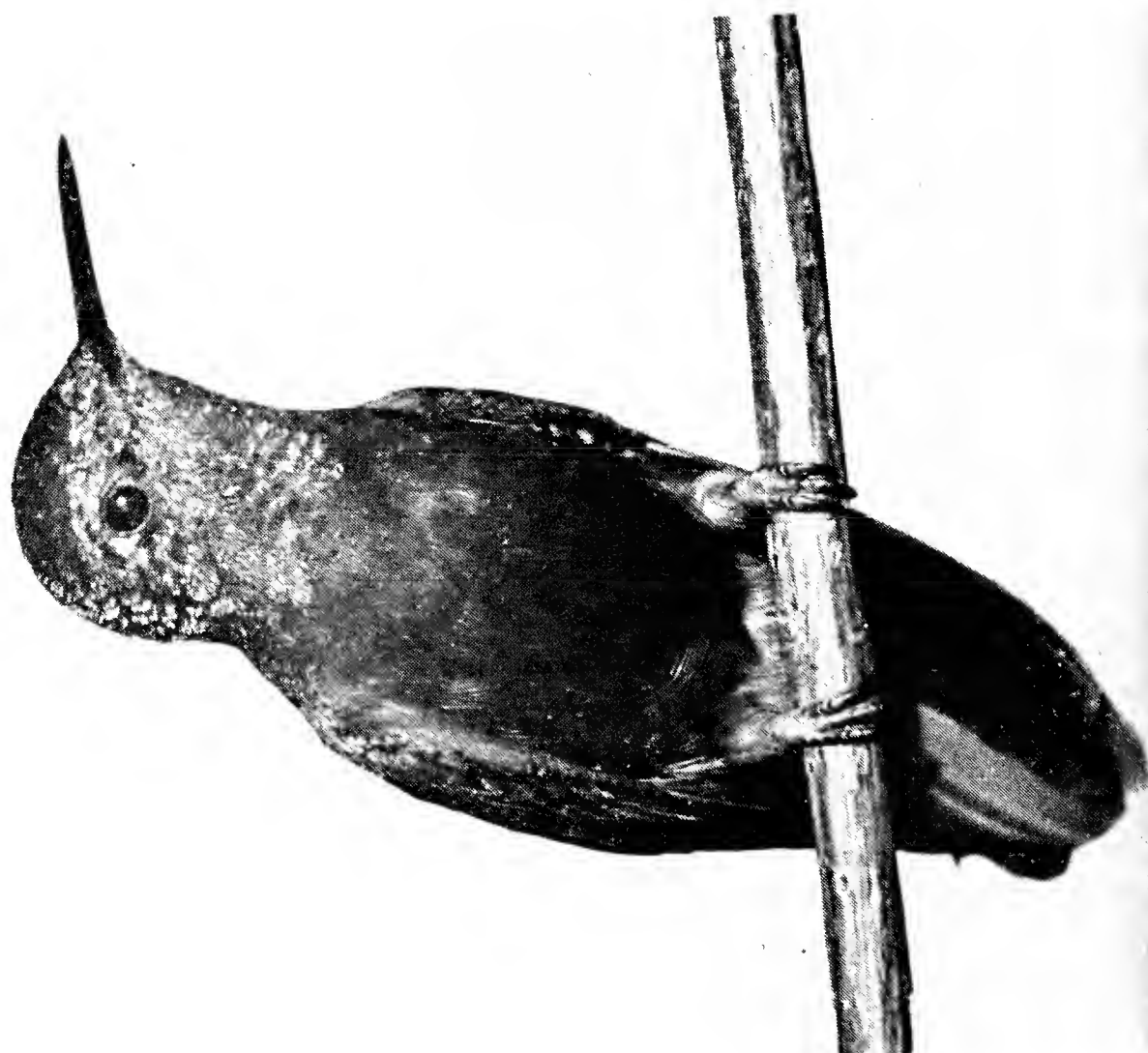
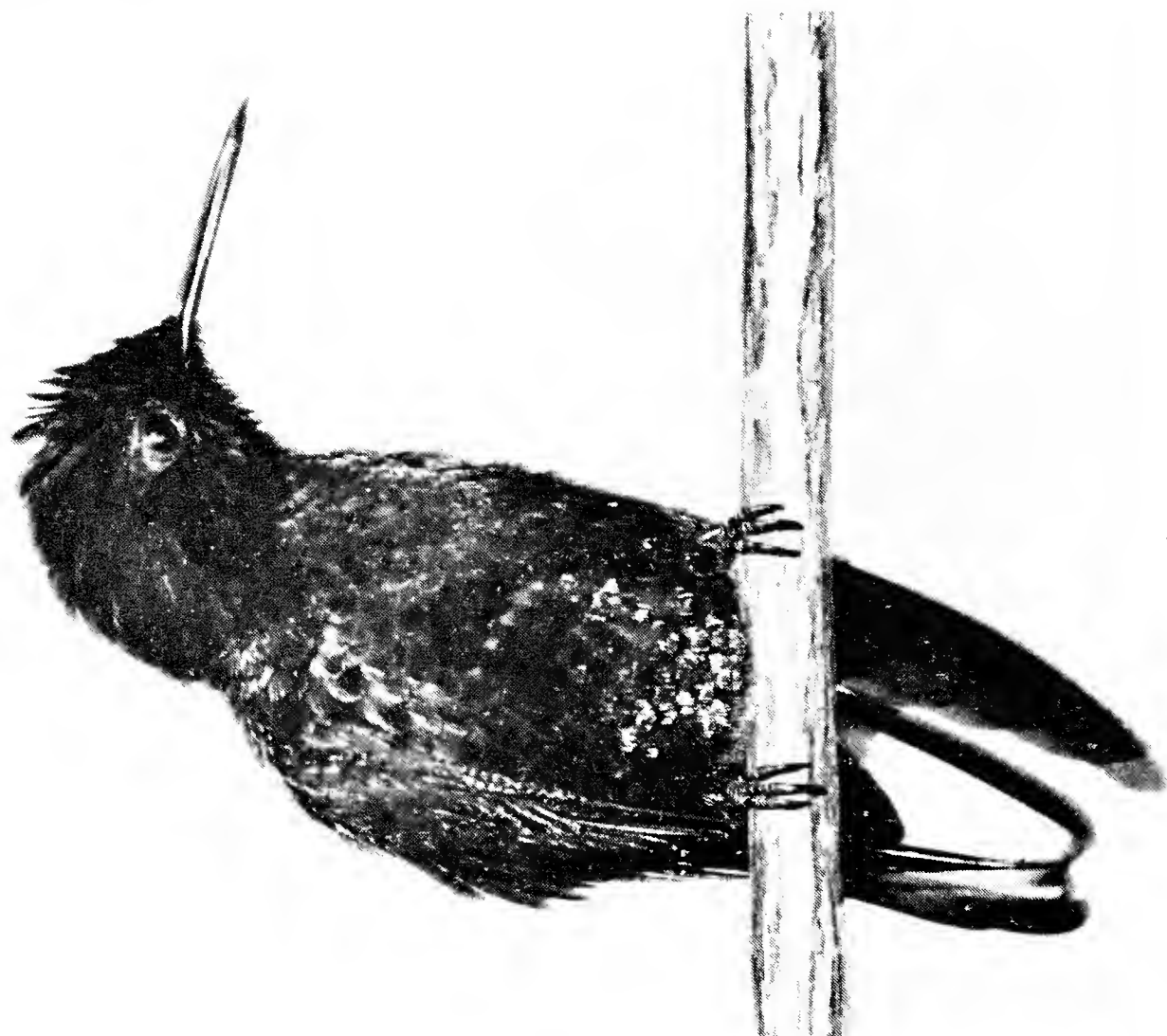
that sounded, to my ear, like "Dear Boy". As she "Dear-boyed" the head was nodded into a slight bow and the tail flared wings slightly depressed (fig. 7). The head was pulled upright after each "Dear boying" stopped.

Later one of the hens that lost her chicks was subsequently heard, day after day out, calling and seen "nodding" while sitting outside her nest hole or sitting slightly away from it.

A further hen, not one of the colony, late paired to a skulking, seeming "asexual" cock often performed as described for Bigamist's second wife. After a long period she laid three infertile eggs.

My interpretation of Nodding calls is that it is an advertisement call from unmated hens wishing to breed.

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My last note concerns male-like activity between two hens—one adult and one immature. Before the adult hen laid I saw her courtship-feeding the immature hen and later, after I took her chicks away and entered them off I saw her Crane-preening the same young female.

REFERENCES

- MOBBS, A. J. and RIPLEY, S. D. 1969. *Handbook of the Birds of India and Pakistan*, 3, 169, 172. (O.U.P.)
- MOBBS, A. J. and RIPLEY, S. D. 1968. Behaviour of the Blue-crowned Hanging parrot *Loriculus galgulus* with Comparative Notes on the Vernal Hanging parrot *L. vernalis* *Ibis*, 110 : 145-165.
- MOBBS, A. J. and RIPLEY, S. D. 1968. Handrearing Golden Mantled Rosellas from the age of One Day. *Parrot Society Magazine*, 2 : No. 11. 221-227.
- MOBBS, A. J. and RIPLEY, S. D. 1960. The comparative ethology of the African parrot genus *Agapornis*. *Zeits. f. Tierpsych.* 17 : 649-685.
- MOBBS, A. J. and RIPLEY, S. D. 1961. Rainbathing. *Avicult. Mag.* 67 : 90-92.
- MOBBS, A. J. and RIPLEY, S. D. 1955. *A Guide to the Birds of Ceylon*, 185. (O.U.P.).
- MOBBS, A. J. and RIPLEY, S. D. 1961. *Birds in My Indian Garden*, 33-60. (Jonathan Cape).
- MOBBS, A. J. and RIPLEY, S. D. 1970. *African Handbook of Birds*, Ser. 3, 1. 405. (Longmans).
- MOBBS, A. J. and RIPLEY, S. D. 1970. Notes on a Pair of Malayan Longtailed Parrakeets. *Avicult. Mag.* 76 : 181.
- MOBBS, A. J. and RIPLEY, S. D. 1971. Black-headed Caiques. *Avicult. Mag.* 77 : 213.
- MOBBS, A. J. and RIPLEY, S. D. 1953. *The Birds of Burma*, 2nd ed. 333. (Oliver & Boyd).

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THE CORONET HUMMINGBIRDS

By A. J. MOBBS (Walsall, Staffordshire, England)

Although all three members of the genus *Boissonneaua* are beautiful, I personally do not find *B. flavescens*, the Buff-tailed Coronet, desirable, as I have the other two species in my collection, I doubt very much I shall ever be tempted to purchase a Buff-tailed.

Like all members of this genus, the Buff-tailed is a largish hummingbird, measuring almost 5 in. overall length. The crown and throat are glittering emerald green. Upperparts are shining bronzy green; the breast is also shining green turning to buff on the belly, with a few green feathers here and there. Central tail feathers are bronze, the remainder being pale buff tipped and edged with bronzy green. Sexes are almost identical.

In my notes on this genus which appeared in the 9th July, 1970 edition of *3 AND AVIARY BIRDS*, I mentioned Coronets were highly pugnacious because of this were not really suitable subjects for a communal flight aviary of hummingbirds. I still stand by this, even though at the time of writing I have a Velvet-purple Coronet, *B. jardini*, and a Chestnut-sided Coronet, *B. matthewsii*, in a flight with other hummingbirds.

What I have just written will seem contradictory and to explain myself, I go back to April, 1969. On the 5th of that month, I became the proud owner of a Velvet-purple Coronet. For a number of years I had dreamed of owning one of these truly fantastic hummingbirds, but until

the bird was actually installed in my birdroom, I had not really believed I would ever be so fortunate as to realise this dream.

This bird was a little underweight at the time of purchase, it was also showing a small amount of tongue. However, as it had only been in the country just over a day, it had not had sufficient time to regain strength and replace the loss of flesh caused through the long journey from Ecuador.

For the first 14 weeks, the Velvet-purple was housed in a cage, 48 in. long by 36 in. high by 16 in. deep, but as these quarters seemed rather cramped for such a large hummingbird, I reluctantly parted with a Fork-tailed Woodnymph, *Thalurania furcata*, which was housed in the adjoining cage, took the divider out, thus allowing the Coronet to have a flight cage twice as long as before.

After being with me four months, the Velvet-purple commenced moult. This is always a worrying time when it is the birds' first moult in captivity, as I find it can be a lengthy process. Successive moults however, are usually quickly over.

I did not like housing such a large species in a cage and I had my doubts as to whether the bird would moult out perfectly, having experienced trouble in the past with Sparkling Violet-ears, *Colibri coruscans*, in that their outer primaries sometimes came in deformed when cage moulted. My fears were to be proved groundless, however, as in 20 weeks the Coronet moulted out to perfection. This was, I admit, an exceptionally lengthy moult but as I have already mentioned, I do find hummers can take a long while over their first moult in captivity.

In 1970, the Coronet commenced its second moult in captivity on 8 August and had completed this by 9th November. The following year the Coronet commenced moulting on 30th July and finished 25th October, thus taking approximately 13 weeks each time. This proves what I have already mentioned; once the first moult in captivity is completed, successive moults are little or no trouble.

While the Velvet-purple was in its second moult, I decided to attempt keeping it with my other largish hummingbirds which are housed in 18 ft. indoor flight. The birds in this flight were well established and as the Coronet was in heavy moult, I did not expect fighting to break out. As the Coronet had been living in a cage for 18 months, I fully expected him to take a while to settle into the flight. He did prove a little difficult when the birdroom lights were dimmed, but no more than a new addition usually does. A few days after being released into the flight, the Coronet seemed very settled and other than taking over one particular perch was not in the least belligerent.

The time to tell whether a normally belligerent species is going to prove suitable for housing with other hummingbirds, is just after a moult has been completed. This is when hummingbirds are really at their peak. The Velvet-purple did show aggression to some of the other hummers.

s time, but as these had become accustomed to him, they took little notice and he soon gave up trying to intimidate any of them.

I did not witness a display from the Velvet-purple while he was caged. I did consider some of his actions to be a form of "showing off", however, that he would fly up and down the length of the flight cage very slowly, when alighting on a perch would hold his head and wings fully erect longer than is usual. While "showing off" the Coronet would feed more often than was necessary, taking small sips from the nectar tube before returning to the perch to stand proud again.

With the extra freedom of the flight, I did not have to wait long before witnessing the true display of this species. In fact, within a week of completing the moult, the Coronet was displaying regularly. In normal flight, Coronets have rather slow wing beats, therefore I was not surprised to learn the wing beats are slow in the display procedure also. The bird holds the tail upwards at an angle of 60 degrees; the feathers are not spread, however. The head is drawn in close to the body and the bird moves in front of the object of display using slow jerky movements. The beak is held slightly open throughout. Although compared to many species, the display of the Velvet-purple is rather simple, it does seem to me the bird somewhat, probably because of the unusual jerky movements. After displaying, the Coronet usually alights on a perch and goes through the motions of mating. After a particularly strenuous display, the Coronet takes a few sips of water from one of the bathing saucers. This bird takes water after a particularly strenuous flight, therefore it is probable the water has a cooling effect.

The wing action peculiar to this genus is very much in evidence both before and after the actual display, as before commencing to display, the bird, while perched, will hold the wings erect and bob the head, moving it from side to side at the same time. These movements give the impression that the Coronet is hunting for a likely subject at which it can direct its attack. The upright wing action is also used when the bird goes through the motions of mating, directly after the completion of a display.

When caged, the Velvet-purple would on occasions utter a loud call—usually when showing aggression to birds in the flight opposite. When it settled to life in the flight, the Coronet started to sing regularly. The song is rather subdued and one has to listen carefully to hear it.

The male Velvet-purple Coronet has most of the head, neck and throat entirely black. The forecrown, upper throat, entire breast and belly is shining purple. The back and rump is glittering bluish-green. The wing coverts are orange-rufous; upper-tail coverts and the two central tail feathers are black, remainder of tail feathers being white and tipped with black. The female Velvet-purple is similar to the male but is a little duller in colouration and sometimes has a chestnut patch on the centre of the breast and buff bases to the feathers on the throat and belly. All the females I have seen, have had white ocular

patches, whereas the males have not. Both sexes have a certain amount of white feathering on the legs.

The male Chestnut-breasted Coronet is also very beautiful. It has upperparts of shining green, with throat and sides of head glittering golden green. The breast, belly and under tail coverts are deep chestnut. Central tail feathers are bronze, the remainder chestnut, tipped and edged with bronze. The female is similar but only has a few glittering green feathers on the throat. As with the Velvet-purple, the Chestnut-breasted has slightly feathered legs; these feathers are buff.

I purchased the Chestnut-breasted on the 9th July, 1971. I was dubious as to how long this bird would remain in my collection as I intended releasing it into the flight and if the Velvet-purple took a dislike to it (and coming from the same genus I thought it highly likely he would), I knew I would have to part with the former as I had no intentions of keeping it caged. Directly the Chestnut-breasted was released into the flight, the Velvet-purple attacked and they fell to the ground with their claws locked in each other's breast feathers. For a full minute both fought furiously then the Velvet-purple broke away, flew to the bathing saucer for a drink of water and from then on kept well away from the Chestnut-breasted. For a day or so the Velvet-purple seemed terrified of the newcomer although the latter completely ignored him. They have now been living together for almost a year and as long as they do not actually perch close to each other, peace reigns.

The Chestnut-breasted seems to ignore all the other hummingbirds in the flight except for a Sapphire-vented Pufflegs, *Eriocnemis luciani*. The Pufflegs attacked the Coronet when it was new to the flight and now the latter seems to hold a grudge against it and whenever it has the chance to have a sly dig at the Pufflegs, it does so.

Like the Velvet-purple, the Chestnut-breasted has a rather subdued song. I have yet to witness a display from the latter, however, it is only just completing its first moult in captivity, so will not be in breeding condition for a week or so.

On sunny days, the Velvet-purple spends a considerable amount of time sunbathing on the floor of the flight. This is not as unusual as it may appear, as I have observed other species indulging in this habit. I have also read an account in the wild where an Anna's Hummingbird, *Calypte anna*, was observed sunbathing on a bare patch of ground (Bent, 1940).

A peculiarity of the genus *Boissonneaua*, is their habit of resting on the foot in the manner common to most passerines. Relatively few species of hummingbirds indulge in this habit and I doubt very much if the Coronet actually sleep in such a position, as they would require both feet planted firmly on the perch to remain stable during the night period. Hummingbirds do look rather odd when perched on one leg as they seem to find difficulty in sitting upright at such times and always appear to lean towards the foot which is holding the perch.

REFERENCES

- NT, A. C. 1940. *Life Histories of North American Cuckoos, Goatsuckers, Hummingbirds and Their Allies* (Part II). New York : Dover Publications.

* * *

WHY ARE NEOTROPICAL BIRDS MORE COLORFUL THAN NORTH AMERICAN BIRDS?

MARY F. WILLSON (Department of Zoology, Vivarium Building),
and ROBERT A. VON NEUMANN (Department of Art),
University of Illinois, U.S.A.)

When one of us (MFW) was in Costa Rica for a summer, a common question from non-ornithological colleagues was "Why are tropical birds more colorful than those in the U.S.?" The present exercise was motivated by that question, since it was not clear that tropical birds *are* more colorful, much less why.

We have attempted to classify the avifauna of South America, North America, and Europe into categories of "colorful" or "not so", but we recorded degrees of colorfulness. Criteria for the division are necessarily subjective, but we tried to be consistent in their application. If the plumage of a species was described as having fairly large patches of bright yellow, orange, red, blue, purple or green, or any combination thereof, it was called "colorful". For example, the Pileated and Red-headed Woodpeckers of North America were called colorful because of the amount of color on the head of at least one sex, but Downy and Red-bellied Woodpeckers were not. Although some people would undoubtedly categorize species by somewhat different means, we feel that the consistency of our method validates the approach. Decisions about colorfulness were based on descriptions and pictures in three sources: Meyer de Schauensee (1960), Robbins, *et al.* (1966), and Petersen, *et al.* (1966). Some species could be considered striking, flashy, and conspicuous (such as American magpies) were not, however, called "colorful", for their conspicuousness is derived from e.g. black and white patterns, and we felt this was not included in our colleagues' questions. We omitted consideration of primarily aquatic and nocturnal families for the same reason.

At the same time, we recorded the incidence of sexual dichromatism in species and the habitat of each. Habitat, when given, usually referred to the breeding habitat, at least for North American and European birds. Habitats were classified into two general types: "open" (marshes, meadow, sand, etc.) and "wooded" (all woodlands and forests, scrub, etc.). Finer subdivisions were not practicable owing to authors' differences in descriptions. The South American avifauna was split into "tropical" and "non-tropical", which refers both to latitudinal

and altitudinal zones that are not tropical according to Meyer de Schauensee (*op. cit.*), and to wide-ranging species occupying many zones including tropical.

Regional differences in frequency of colorfulness and dichromatism are clear. χ^2 tests ($P < 0.05$) between pairs of regions indicate the following ranking:

DICHROMATISM:

North America = South American tropics > Europe = South America
(39%) (39%) (32%) (26%) nontropics

COLORFULNESS:

South American tropics > South American nontropics = North America
(32%) (27%) (25%)
> Europe (10%)

Birds of the South American lowland tropics are therefore more frequently colorful than those of North America or the South American nontropics; a consideration of degree of colorfulness or combinations of color would have emphasized the difference. European birds are relatively dull in color. Colorfulness is not particularly associated with a tendency toward dichromatism, for North American and South American tropical birds have a higher proportion of sexually dichromatic forms than the others; Europe and the South American nontropical avifaunas tend toward sexual monomorphism.

In almost all cases the incidence of sexual dichromatism and colorfulness in open habitats is similar to their incidence in the entire regional avifauna. An exception is found in the South American nontropics, where colorfulness in open habitats is significantly (χ^2 , $p < 0.05$) less frequent than in the whole avifauna. Given that a species lives in an open habitat, then, it usually has the same probability of being colorful as any species taken from that avifauna.

Although in all four regions the percentage of colorful and sexually dichromatic species that live in the "open" habitats is markedly less than the per cent that live in wooded habitats, the relative number of species living in the open is also less than that of wooded areas. Neither kind of habitat, then, is relatively more conducive to the development of dichromatism or colorfulness.

Certain families clearly contain relatively more dichromatic or colorful species than other families. In addition, for each region, certain families are the largest contributors of species to the dichromatic and colorful portions of the avifauna. However, seldom is an entire family dichromatic or colorful, which argues to some extent against genetic fixation of such a trait within a phylogenetic lineage, in most cases.

Seasonal sexual dichromatism in Nectariniidae, Parulidae, Icteridae (Hamilton 1961, Hamilton and Barth 1962, Skutch 1957), Cera-

merican Fringillidae and Thraupidae (Skutch 1940), and in African Ploceidae (Moreau 1960) was associated with duration and nature of the pair bonds, social behavior in the nonbreeding season, degree of migratoriness, and, for some, habitat. For comparisons of regional avifaunas, however, the explanations do not seem to be general ones. For instance, dichromatism (seasonal *and* permanent) is least developed in the European and South American nontropical avifaunas, but we expect that long distance migration or wandering is probably more common there than in the South American lowland tropics.

Perhaps a general explanation is unavailable. Hamilton and Barth (1962, *ib. cit.*) list several kinds of selective factors that influence the evolution of species-specific plumage patterns. These, and perhaps others, probably vary in their importance among species. Colorfulness is equally difficult to assess, especially in view of our ignorance of the possible adaptive nature of bright plumages amidst brightly colored flowers, fruits and leaves, and of our lack of information concerning relative predation pressures.

Summary

Tropical birds of South America are more frequently colorful than those of North America or nontropical areas of South America; European birds are the least colorful of all. Assessment of degree of colorfulness or color combinations would likely increase most of these differences. Sexual dichromatism is most common among members of the North American and South American tropical avifauna, and least in Europe and the South American nontropics. Habitat association of these characters are not generally evident, and taxonomic associations not very helpful. At this time we seem to lack a general explanation for the evolution of the observed tendencies.

LITERATURE CITED

- MILTON, T. H. 1961. On the functions and causes of sexual dimorphism in breeding plumage characters of North American species of warblers and orioles. *Am. Nat.* **95** : 121-123.
- MILTON, T. H. and BARTH, R. H. 1962. The biological significance of seasonal change in male plumage appearance in some New World migratory bird species. *Am. Nat.* **96** : 129-144.
- MYER DE SCHAUENSEE, R. 1970. *A Guide to the Birds of South America*. Livingston Publ. Co., Wynnewood, Pa.
- MOREAU, R. E. 1960. Conspectus and classification of the Ploceine weaverbirds. *Ibis* **102** : 298-321.
- MERSON, R. T., MOUNTFORT, G. and HOLLOM, P. A. D. 1966. *A Field Guide to the Birds of Britain and Europe*. H. M. Co., Riverside Press, Cambridge, Mass.
- POBBINS, C. S., BRUNN, B., and ZIM, H. S. 1966. *A Guide to Field Identification. Birds of North America*. Golden Press, N.Y.
- SKUTCH, A. F. 1940. Some aspects of Central American bird-life. *Sci. Monthly*, **51** : 409-418; 500-511.
- SKUTCH, A. F. 1957. The resident wood warblers of Central America. In Griscom, L., Sprunt, A., et al. *The Warblers of America*. Devin-Adair N.Y. : 275-285.

APPENDIX I. Numbers of sexually dichromatic and colorful species in each family. Winter visitors and regular migrants from North America are included in the South American tallies because many of these live for several months in low latitudes. Accidental and exotic species and occasional visitors are omitted. The systematic classification of each source book are retained, and brackets used to indicate correspondence between regions.

A. Europe	#spp.	#dichromatic (%)	#colorful (%)
Accipitridae	28	6 (21%)	0
Falconidae	10	4 (40%)	0
Tetraonidae	5	4 (80)	0
Phasianidae	6	1 (17)	0
Turnicidae	1	0	0
Otididae	3	1 (33)	0
Burhinidae	1	0	0
Glareolidae	3	0	0
Pteroclididae	3	3 (100)	0
Columbidae	6	0	0
Cuculidae	3	0	0
Apodidae	3	0	0
Meropidae	1	0	1 (100)
Coraciidae	1	0	1 (100)
Upupidae	1	0	0
Picidae	10	6 (60)	1 (10)
Alaudidae	11	1 (9)	0
Hirundinidae	5	0	2 (40)
Motacillidae	10	3 (30)	2 (20)
Laniidae	5	2 (40)	0
Bombycillidae	1	0	0
Cinidae	1	0	0
Troglodytidae	1	0	0
Prunellidae	1	0	0
Musicapidae	77	29 (38)	5 (6)
Paridae	11	0	2 (18)
Sittidae	4	0	0
Certhiidae	2	0	0
{ Emberizidae	14	10 (71)	2 (14)
{ Fringillidae	19	13 (68)	8 (42)
Ploceidae	5	2 (40)	0
Sturnidae	3	0	1 (33)
Oriolidae	1	1 (100)	1 (100)
Corvidae	12	0	1 (9)
Totals	268	86 (32%)	27 (10%)

North America	#spp.	#dichromatic (%)	#colorful (%)
Cathartidae	3	0	0
{ Accipitridae	23	2 (9)	0
{ Pandionidae	1	0	0
Falconidae	7	3 (43)	0
Meleagrididae	1	0	0
Cracidae	1	0	0
Tetraonidae	10	9 (90)	0
Phasianidae	6	4 (67)	0
Columbidae	11	1 (9)	0
Cuculidae	6	0	0
Apodidae	4	0	0
Trochilidae	15	14 (93)	15 (100)
Psittacidae	1	0	1 (100)
Trogonidae	1	1 (100)	1 (100)
Picidae	22	15 (68)	8 (36)
Cotingidae	1	1 (100)	0
Tyrannidae	31	1 (3)	3 (9)
Alaudidae	1	0	0
Hirundinidae	8	1 (13)	2 (25)
Corvidae	15	0	6 (40)
Paridae	14	2 (14)	0
Chameidae	1	0	0
Cinclidae	1	0	0
Sittidae	4	2 (50)	0
Certhiidae	1	0	0
Troglodytidae	10	0	0
Mimidae	10	0	0
{ Turdidae	13	7 (54)	6 (46)
{ Sylviidae	5	4 (80)	0
Motacillidae	4	0	1 (25)
Bombycillidae	2	0	0
Ptilogonatidae	1	1 (100)	0
Laniidae	2	0	0
Coerebidae	1	0	1 (100)
Vireonidae	12	1 (9)	1 (9)
Parulidae	53	36 (68)	25 (47)
Icteridae	20	18 (90)	11 (55)
Thraupidae	4	4 (100)	4 (100)
Fringillidae	77	32 (42)	16 (21)
Totals	403	159 (39%)	101 (25%)

C. South America (cont.)

	TROPICAL			NONTROPICAL		
	#spp.	#dichrom. %	#colorful %	#spp.	#dichrom. %	#colorful %
Oxyruncidae	1	1 (100)	0			
Phytotomidae	1	1 (100)	0	2	2 (100)	0
Alaudidae				1	0	0
Hirundinidae	11	2 (18)	1 (9)	9	0	2 (22)
Corvidae	11	0	7 (64)	2	0	2 (100)
Troglodytidae	28	0	0	11	0	0
Mimidae	5	0	0	3	0	0
{ Turdidae	20	4 (20)	0	12	5 (42)	0
{ Sylviidae	8	3 (38)	0			
Motacillidae	2	0	0	5	0	0
Vireonidae	19	0	2 (11)	3	0	0
Icteridae	48	11 (23)	30 (63)	15	6 (40)	8 (53)
Parulidae	27	8 (30)	21 (78)	21	7 (33)	10 (48)
Coerebidae	19	15 (79)	74 (14)	18	5 (28)	4 (22)
Tersinidae	1	1 (100)	0			
Thraupidae	126	69 (55)	81 (64)	49	13 (27)	27 (55)
Catamblyrhynchidae	1	0	0			
Fringillidae	112	46 (41)	20 (18)	73	36 (49)	19 (26)
Totals	1678	657 (39%)	539 (32%)	722	186 (26%)	194 (27%)

NEWS FROM THE BERLIN ZOO

By PROFESSOR DR. HEINZ-GEORG KLOS

After waiting for years, we finally succeeded in breeding a Trumpete Swan (*Cygnus c. buccinator*), the first on the European continent. During the time of the settlers in America, towards the end of the 19th century this species, the largest swan of the world, hitherto widespread, was soon threatened with extinction. Strict precautions were taken to save this species, but the birds are still rare in America (about 2100). So we are extremely pleased with our success and do hope it will now be repeated every year.

Also very rare (as was mentioned in an earlier report) are the Hawaiia Geese (*Branta sandvicensis*). After our first pleasant success in breeding two young of this species last year, we are now able to report the first number of six.

In our valuable crane collection, the White-necked Cranes (*Grus vipio*) laid eggs every year. So far they had been sterile, but this spring young one was hatched in the incubator and hand-reared.

Interesting newcomers are three Striped Owls (*Rhinoptyx clamator*) from the Gran Chaco in South America. These prettily coloured owls are not only seldom exhibited in zoological gardens, but also belong to the ornithological rarities in their native country. Their preferred habitat is grassland and open forests. Contrary to most owl species which nest in the trees, the Striped Owl sits on the ground among thick bunches of grass. On light sandy ground among dead halms their striped-ochraceous plumage is a perfect camouflage against animals or birds of prey.

Further breeding successes are:

1 Black-footed Penguin (*Spheniscus demersus*), 2 Silver Gulls (*Larus novaehollandiae*), 2 Black-necked Swans (*Cygnus melanocoryphus*), 3 Baikal-headed Geese (*Anser indicus*), 4 Snow Geese (*Anser c.c. caerulescens*), Common Shelducks (*Tadorna tadorna*), 3 Ruddy Shelducks (*Tadorna ferruginea*), 2 Egyptian Geese (*Alopochen aegyptiacus*), 3 Magellan Geese (*Chloephaga picta*), 8 Andean Crested Geese (*Lophonetta specularioides alticola*), 4 European Wigeons (*Anas penelope*), 6 Red-Crested Ducks (*Netta rufina*), 26 Carolina Wood Ducks (*Aix sponsa*), 2 Chukar Partridges (*Alectoris graeca chucar*), 2 East American Turkeys (*Meleagris gallopavo silvestris*), 2 Nepalese Pheasants (*Gennaeus l. leucomelanus*), 5 Siamese Firebacks (*Diardigallus diardi*), 2 Blue-eared Pheasants (*Crossoptilon auritum*), 1 Blue Crowned Pigeon (*Goura cristata*), 1 Andean Condor (*Vultur gryphus*), 1 Barn Owl (*Tyto alba*), 2 Boobook Owls (*Ninox novaeseelandiae boobook*).

Newcomers (in addition to the Striped Owls) are: 1 South African Blue-necked Ostrich (*Struthio camelus australis*), 2 Lilford's Crane

Grus g. lilfordi), 5 James' Flamingos (*Phoenicoparrus jamesi*), 3 Crested Ibis (*Chauna chavaria*), 1 Golden Pheasant (*Chrysolophus pictus*), Tawny Owl (*Strix a. aluco*), 3 Fischer's Lovebirds (*Agapornis fischeri*), Blue-and-yellow Macaw (*Ara ararauna*), 2 Angola Red-crested Turacos (*Tauraco erythrolaphus*), 6 Sparkling Violetears (*Colibri coruscans*), a pair of Quetzals (*Pharomachrus mocino*), 1 Cardinal (*Cardinalis cardinalis*), Bullfinches (*Pyrrhula pyrrhula*), 3 Spice Finches (*Lonchura punctulata*), Three-coloured mannikins (*Lonchura malacca atricapillis*), 1 Mexican Green Jay (*Cyanocorax yncas luxuosus*), and a pair of Red Birds of Paradise (*Paradisaea rubra*).

* * *

NEWS AND VIEWS

A Cornish Chough has been hatched at Newquay Zoo from four eggs produced by three pairs lent to the Zoo by J. Rogers.

* * *

A pair of Ospreys are nesting again at the Loch Garten reserve of the Royal Society for the Protection of Birds.

* * *

The pair of Black Swans at Kew Gardens had five well grown Cygnets at the end of May.

* * *

Among the species recorded recently as seen in Britain rarely or for the first time are the Siberian Tit in East Anglia, the Little Egret, the Gyr Falcon and the Spotted Crake in the London area, and the Hooded Warbler in the Isles of Scilly.

* * *

The Hawaiian Goose, which was saved from extinction due partly by a highly successful captive breeding programme at the Wildfowl Trust, Slimbridge, is facing a novel threat. The species is having to compete with hippies, who have settled in the National Park in Hawaii, for the native strawberries which form an important part of their diet. Fortunately the Nene will eat other flowers, seeds and berries which the hippies will not!

* * *

Marauders descended from escapees from mink farms are becoming a common hazard to collections of pheasants and waterfowl. According to the *Sunday Telegraph* a new mink-proof fence is being erected around the Wildfowl Trust's site at Slimbridge at a cost of £60,000.

* * *

Dr. C. Harrison has drawn my attention to "Captive Breeding of Nocturnal Birds of Prey" (Vol. I, No. 2, 1971) which has been produced by E. Kenward for the British Falconer's Club and the Hawk Trust.

Its contents include accounts of the breeding of the Sparrowhawk in 1969 and 1970 in Switzerland, the Common Buzzard in 1971 in Britain by R. C. Tout, and hybrids from a male Peregrine and a female Saker in Ireland in 1971. There is also a description of the hand-rearing of Peregrines in Germany from artificially incubated eggs laid by captive birds.

* * *

Our member R. W. Goodwin of Cheltenham has got together during the last few years a comparatively small but very select collection of rare Parrakeets accommodated in a range of practical, well constructed attractively laid-out aviaries. The collection includes such rarities as Salawati and Australian King Parrots, and Crimson-winged, Cloncurry and Blue-cheeked Rosella Parrakeets. In 1971 the following parrakeet were reared successfully: 5 Cloncurries, 4 Pileated, 4 Rock Peplars, Barnard, 6 Pennants, 4 Stanleys, 4 Barrabands and numerous White Cockatiels.

* * *

No-one can have done more to advance the cause of aviculture than Len Hill. When he first opened his lovely gardens and aviaries to the public about fifteen years ago he could scarcely have imagined the immense pleasure which countless visitors would derive from "Birdland". Many all-bird Zoos have been established in recent years but few can compare with "Birdland" in the way in which perfect specimens of exotic species are exhibited in a beautiful garden setting. One of the most outstanding features is the large Tropical House at the entrance of which are several small planted enclosures which accommodate, at the present time, Jamaican Streamer-tailed, Coquette and Racquet-tailed Hummingbirds in perfect condition. Inside the house can be seen the most glorious male Quetzal with every feather absolutely perfect. If you sit quietly in this beautifully planted enclosure you will soon be able to observe close at hand Banded and Giant Pittas, Thailand Hoopoes, Bee-eaters of different species, Blue-crowned Hanging Parrots, Royal and Amethyst Starlings and many others. The pair of Little Minivets are known to be at least twelve years old. The Indian Zosterops breed there every year and a pair of White-browed Robin Chats reared youngsters for several successive years until their aggressiveness necessitated their removal to another enclosure. Last year the Giant Pittas built a nest the size of a football but nothing more happened. In April this year a Pied Jacobin and a Sabre-winged Hummingbird were building a nest as also were a pair of Yellow-crowned Bulbuls.

The Tropical House was built several years ago. More recently a large walk-through aviary intended to house Birds of Paradise was constructed. It has not been entirely successful in its original intention because the Red Birds of Paradise which were its first occupants began to fight badly.

soon as they developed adult plumage and they had to be removed. However it accommodates a successful breeding colony of Rothschild's Grackles, a pair of Green Oropendolas and a pair of the exquisitely beautiful Malayan Peacock Pheasants which hatched a chick in 1971 but let it die when it was 23 days old. Next is another newly constructed aviary which makes perfect quarters for Victoria and Scheepmaker's Crowned Geese and for more Rothschild's Grackles.

The Penguin enclosure, a great attraction to visitors, accommodates the King, Rockhopper, Gentoo, Jackass, Humboldt and Macaroni species, of which except the Gentoo have bred. The collection is constantly expanding and recent arrivals include Wilson's Birds of Paradise, Rufous-bellied Noddies, two Renault's Ground Cuckoos, two Indigo Flower Finches, four Mountain Witch Doves from Jamaica to add to the two painted cocks in the Tropical House, White-crowned Pigeons and White-fronted Doves, a very rare Challenger Lory and two Moluccan King Parrots (one Amboina and one Salawati) which, it is hoped, are a pair.

Len Hill is an ardent conservationist and his main objective is to keep pairs of relatively few species in conditions conducive to breeding. Hahn's Macaws have bred consistently in the Gardens and it is hoped that some of their offspring will ultimately be responsible for the restocking of the native habitat where they appear now to be extinct. Other breeding successes in 1971 include one Purple-naped Lory, three Senegal Parrots, four Rothschild's Grackles, four Bleeding-heart Pigeons and five Bearded Vultures. Swift Parrakeets were hatched but not reared. The Gardens are constantly being improved and, after the opening in May of a Wild Life Art Gallery, the next development will be the reconstruction of the old Tropical House near the main entrance to provide ideal accommodation for possible breeding pairs of Cock-of-the-Rocks and similar attractive species.

J.R.H.

* * *

REVIEWS

WILDFOWL IN CAPTIVITY. By RICHARD MARK MARTIN. London: John Gifford, 1972. Price £1.75.

Waterfowl keeping and breeding is becoming increasingly popular, and so more and more useful, for it no doubt constitutes at present the best way of saving numerous species threatened with extinction owing to man persecution and habitat destruction.

The present work is the latest published book on the practical treatment of wildfowl in captivity, and it is an unusually satisfactory one. Without any pretence to be a scientific monograph, it certainly achieves its object—give beginners all the information and advice which they require.

The author shows a great deal of personal experience and he writes attractively. The first three chapters consist of an introduction to wildfowl, the conception of confining wildfowl and their general management. They could not have been better written; easy to read they cover all one should know when one starts.

The fourth and longest part is a general review of the family tribe by tribe. It is accurate and sufficiently detailed. Practical information on the various species or group is sound, personal and pleasantly expressed. Thirty-two excellent photographs illustrate the text and there are useful line drawings of different installations.

A most commendable little book, which will help all those who begin to indulge in the delightful hobby of waterfowl keeping.

J.D.

* * *

A BIRD IS BORN. By E. BOSIGER and J. M. GUILCHER. Starling Nature Series. London: Oak Tree Press, 1971. Price £1.25.

This little book is one of an excellent series of introductions to various animal and plant groups. In this volume the embryonic development, birth and growth of a bird is followed by a varied selection of British birds to show their diverse habits and adaptations to different environments. The book is profusely illustrated with splendid close-up and X-ray photographs, and should appeal to all ages.

A.L.

* * *

CORRESPONDENCE

INFORMATION ON GROSBEEK STARLINGS WANTED

I can find very little information concerning the Grosbeak Starling, *Scissirostrum dubium*, in literature, and none at all regarding any in captivity. I would be interested to know if any have been imported into Britain during the last few years, and if anyone now has any. I have a cock bird, but lost the female through liver complaint.

MICHAEL SHERBORNE,

12 Tackley Road,
EASTVILLE, BRISTOL 5.

* * *

CORRIGENDUM

The letter from Professor Kenneth C. Parkes published in the March/April number 1972 (page 75) should have been entitled "Sympatric species of *Amazona* parrots" NOT "Sexing Parrots". The Editor offers sincere apologies to Professor Parkes for this error.

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NEW MEMBERS

The thirteen Candidates for Membership in the May/June 1972 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

CANDIDATES FOR MEMBERSHIP

- WM. F. ACUFF, 11628, Amestoy Avenue, Granada Hills, California 91344, U.S.A.
DR. LUIS F. BAPTISTA, Max-Planck-Institut für Verhaltensphysiologie, Vogelwarte Radolfzell, 7761, Moggingen Am Scholfsberg, West Germany. Proposed by G. O. Bray.
MR. K. BASTIEN, "Funchal" 69, Madeira Road, Ventnor, Isle of Wight.
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Male Brewer's Blackbird and two of the youngsters.

[Michael Ba

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SEPTEMBER-OCTOBER 1972

BREEDING OF BREWER'S BLACKBIRD IN THE BERLIN ZOO

(*Euphagus cyanocephalus*)

By WOLFGANG GRUMMT (Curator of Birds, Tierpark, Berlin, GDR)

In March 1969 through the kindness of my friend Dr. James M. Nolan Jr. of the San Diego Zoo we received a number of various small birds and included among them was a pair of Brewer's Blackbirds (*Euphagus cyanocephalus*). This species occurs in open country in western north America from British Columbia to California, North Arizona and New Mexico.

The feathers of the male are glossy black with a purple sheen on the head. The iris is white. The female is predominately grey and is similar to the female Rusty Blackbird in appearance, though can always be distinguished from this species by the dark iris.

In 1970 we kept the pair in an outside aviary 4 m. × 2 m. × 2 m. together with White-crowned Sparrows, Mourning Doves and Hume's Red-tailed Pheasants.

We often observed the display posture described by Williams (1952) as "fluff out". In this posture the male holds the bill horizontally or tilted slightly upwards with the feathers on the head, neck, breast and under tail-coverts erected. In addition it "spreads the wings downwards, fans and depresses the tail, and at the climax either "squeee" or "hl-r-r-r—up" is uttered, and then display immediately subsides.

At the beginning of June a nest was constructed in a few days in the fork of a branch 1.60 m. up in a bush. The female built the nest alone and the male was only occasionally observed carrying nesting material. Dry and fresh blades of grass were used for nest material and also soft earth so that the interior of the nest is similar to that of the Song Sparrow. On 5th July the first egg was laid and by 8th July three further eggs were laid at intervals of about 24 hours. The eggs are comparatively

large and the ground colour is blue-grey with grey, brown and black spots. The female only broods. On 20th July only two eggs remained in the nest and on 21st July the nest was empty.

In 1971 display and nest building again took place but without any successful breeding. Only the remains of broken eggs were found in the aviary.

At the beginning of January 1972 we placed the Brewer's Blackbirds in a glass compartment of 2 m. \times 1.8 m. \times 1.2 m. and by the end of January the bird keeper noticed that nesting material was being carried about. We therefore provided an old Blackbird's nest as a foundation and on 12th February the female carried dry blades of grass and Scotch Pine needles (*Pinus silvestris*) and built actively in the old Blackbird's nest. One day later an egg was laid and by 18th February a clutch of six eggs was completed.

This early start to breed was very surprising as, according to Williams (1952), breeding does not start till the middle of April.

The female again undertook all the brooding. On 29th February two young hatched and on 1st March there were four young in the nest. The fifth young did not hatch till 2nd March and the sixth egg disappeared. As the female began to brood immediately after laying the fifth egg on 17th February the young therefore hatched after an incubation period of 12–13 days, as has already been noted by Williams.

The adult birds are rather shy and only on a few occasions could be observed caring for the young. Both male and female fed the young almost exclusively on live food (mealworms and cockroaches). Some food with dried ant eggs, hardboiled eggs and curds were certainly eaten by the adult birds but whether they also gave this to the young could not be ascertained. The young birds are covered in smoky-brown down and the eyes opened in 6–7 days.

One young bird was missing on the third day and on 10th March a youngster was found dead in the nest, but the other three grew well. At 14 days of age the young were fully feathered and similar in colour to the female, though there was still some down on the head and the tail was not full grown. In 16 days the young left the nest (according to Williams they fly at 14 days) and at once ran around sturdily on the aviary floor. The young were still fed by the parents though even after a few days of leaving the nest they were observed to be feeding on their own. At the age of five weeks the young birds began to moult their small feathers and in the males—there are two males and one female—the first black feathers were already showing on their breasts.

REFERENCES

- REILLY, E. M. JR. 1968. The Audubon Illustrated Handbook of American Birds. New York, Toronto, London, Sydney, Johannesburg.
WILLIAMS, L. 1952. Breeding behaviour of the Brewer's Blackbird. *Condor* 54, 3–47.

NESTING AND NESTLING PARROTS

By GEORGE A. SMITH (Peterborough, Northants, England)

With the exception of Quaker Conures *Myiopsitta monachus*, parrots lay their eggs in sheltered cavities—most species select holes in trees. Although a parrot's bill is excellent for whittling and tearing off portions of wood it is not such a good tool to excavate the whole of the chamber and most species make use of pre-existing holes.

In the wild competition for suitable nest-cavities must be intense and several species avoid disputation with other hole-nesters by boring into termitaria which, once the crust is perforated, excavate easily. Keas *Nestor notabilis* nest in small natural caves (Jackson 1963) and Patagonian conures *Cyanoliseus patagonus* breed in colonies in tunnels excavated by themselves in near-vertical cliff-faces (Johnson 1967).

In captivity parrots are generally provided with wooden nest-boxes. A few ingenious aviculturists have supplied artificial "white-ant nests" for those parrots that naturally nest in the mounds and bosses produced by these insects. e.g. Perry (1959) tells how Red-faced Lovebirds *Agapornis pullaria* successfully bred after they had bored their tunnel through a large piece of cork (12 in. × 10 in. × 6 in.) encased entirely with wood except for the face-side. With the same difficult species Prestwich (1957) got many pairs to nest in holes that they dug in peat-filled barrels. Success, perhaps because of the dryness of the peat, was unfortunately not very high. Reverting to nature Hey (1967) cemented four termitaria together when he bred from his pair. In experimental studies of South American conures Hardy (1963) and Power (1967) used coated polystyrene masses and then, when they were found unsuitable, blocks of cork. Complete success did not occur with either the Orange-fronted Conures *Atinga canicularis* or the Orange-chinned Parrakeets *Brotogeris jugularis*. I believe that I have read somewhere, though I cannot find the reference, of one early breeder of Hooded Parrakeets *Psephotus chrysopterygius* who had success with a "real" ants' nest. However all these species have failed, or since, successfully brought off young in the more usual wooden nest-box. Quaker Conures—which normally build large communal nests of sticks in the branches of trees—nest readily, perhaps preferentially, in a nest-box. Certainly when nest-boxes are given to a colony of Quakers they nest in these, dragging some sticks inside and then try to encompass the boxes with twigs rather than building a twig-nest first before laying. Authors often stress the importance of having a high humidity within the nest-box—by having a layer of vegetable compost: damp peat, rotting wood and inverted turves. The way to avoid rickety or pneumonic chicks, as Tavistock (1927, 1929, 1930) is to provide an open-sided box with moist contents of peat moss or decaying wood—as well as feeding Cod-liver-oil soaked seed. The build up of noxious gases at the expense of

oxygen—together with desiccation—is given as the main cause of loss with “dead-in-shell” in incubated chicken eggs (Allcroft 1964, Carter & Freeman 1969). Decaying vegetable composts could well produce such “noxious gases” and no matter how damp when put inside the box all litter dries, unless especially thick, before incubation is completed—and high humidity is especially needed about hatching time. L. P. Luk (1952) designed a nest-box, for Lovebirds, which had a dish of water inserted beneath the nest pan.

Eggs of different species of birds must vary in their resistance to desiccation: waterfowl eggs have very poor hatchability in incubators designed for poultry—unless liberally sprinkled with water. And pigeons' eggs aerially suspended as they are in the flimsiest of nests, and Ostrich eggs laid in desert sand, must be quite resistant to drying. Holes in trees are often dry—certainly those selected by indigenous birds—sometimes tinder dry. The holes that are available to wild parrots might also often be absolutely clean of rotten wood: either because they were bored in a living tree by barbets and woodpeckers, or by having been scoured out by termites. Nesting holes are more likely in the middle trees—where the bole and thick branches are—which is generally dry as rain is cascaded outwards by the umbrella of foliage.

All the species of parrot that I've bred seem especially concerned to remove as much of the loose litter as they can by digging with the beak and scratching backwards with the feet. Larger items are carried out with the bill. Before Tavistock, most people used to suggest half a Coconut shell cemented in the bottom of the box as a receptacle for the eggs. With the possible exception of Cockatiels *Nymphicus* all the parrots that I have bred have built some sort of nest upon which to lay the eggs. (My boxes are provided with “chewable” strips, as steps, of soft-wood.) Most parrots are contented with a simple layer of splinters, yet Eclectus, New-Zealand Parrakeets *Cyanoramphus* spp., Abyssinian Lovebirds *A. taranta*, Weber's Lorikeets *Trichoglossus haematodus* websteri (Kyme pers. com.) incorporate quantities of feathers, shed (?) from the brood patch, in the nest box filling. Fourteen species of parrot, other than Lovebirds, Hanging-parrots *Loriculus* and Quaker Conures, have been reported to take nesting material into the nest hole. These include Palm Cockatoos *Probosciger*, Black Cockatoos *Calyptorhynchus* spp., White Cockatoos *Cacatua* spp., Caiques *Pionites* (Deurer-Bury 1971), Aymara and Lineolated Parrakeets *Bolbopsittacus aymara*, *B. lineatus* (Prestwich 1967, pers. obs.), Splendid Grass-Parrakeet *Neophema splendida* (Perreau (1909) reports that Blue-winged (Parrotlets?) *Forpus passerinus* like Splendid Grass-Parrakeets, Hanging-Parrots and Lovebirds can use nesting material in the rump feathers. Celestial Parrotlets *F. coelestis* nesting with me certainly brought bits of chewed paper and bark into the nest chamber both before the eggs were laid and more continually as they had hatched.

In an attempt to see if vegetable matter is necessary I have experimented, over the past three breeding seasons, with various nest-box "fillers". Coupled with these experiments I have also built some rather curiously shaped boxes to see if I could assess the value of such variables as: size of entrance hole, depth of box, ease of descent down to the nest depression, floor area, and the darkness of the chamber. Because any "standard" "control" with which to compare my results is lacking the observations that I shall make are offered as nothing more substantial than my (present) opinion.

I can say, with absolute truth, that I have yet to have a chick "dead in shell" in outside boxes when the eggs have been laid on bare wood or on a layer of chippings pared off by the parents. This is with such varied species as Red and Yellow-fronted New-Zealand Parrakeets *C. novaeseelandiae* and *C. auriceps*, Indian Ringnecked Parrakeets, Malayan Long-tailed Parrakeets *Psittacula krameri* and *P. longicaudata*, Cockatiels, many-coloured and Red-rump Parrakeets *Psephotus varius* and *P. amatonotus*. This was not the case when I used to fill with rotten wood, turves and/or damp peat.

My parrots are given ample bathing facilities and the incubating hens and incubating cocks as well with Cockatiels) often bathe and they will turn to the eggs in a soaking condition. If they sit on dry peat (is there a substance less liable to take up water than bone-dry peat?) or dry compost, the nest-box "filler" always dries on the top—the water in the bird's plumage can hardly affect the litter. Sitting on wood the whole bird in contact gets wet.

Indoors the situation is different, my Blackheaded Caiques *Pionites melanoleuca* have had, from four clutches of three eggs, but a single chick hatch each time—the rest being dead in shell. The fifth clutch, with a teaspoonful of water (5 ml.) put into the nest once a week and two of the four eggs hatched. The sixth and present clutch of three eggs was watered more generously with half a cup of tepid water once a week—the peat easily absorbs this quantity for it is more than an inch deep with wood shavings and moulted feathers—all three have hatched and at six weeks old are like being reared. This particular Caique hen does not often bathe. Celestial Parrotlets in the same shed hatched all their fertile eggs (four out of eight) with no "irrigation" except for two separate, and rather frequent, sprinklings of the outside of their box with water. Celestial Parrotlets, I believe, do not bathe in standing water. When my chicks hatch in these bare-bottomed boxes (the bases are carved into a cupped shape—like a pan) and if the parents have not supplied enough splinters I put an occasional sprinkle of sawdust to absorb the faeces.

According to the article on nest sanitation in *A New Dictionary of Birds* parrot chicks are supposed to have particularly dry faeces that powder and so avoid soiling of the nest. From my own observations it seems that the nature of parrot chicks' "droppings" depend entirely upon

the amount of moisture fed by the parents—or the hand-rearer. The “powdering” does not seem to be other than dehydration of faeces voided in a warm environment. I have noticed with parrot chicks that they deposit their “movements” away from the nest hollow—backing outwards—from an early age. This habit allows the faeces to dry before they get carried back on feet, or enveloped by the expanding size of the growing chicks.

Parrots can be rather dull subjects when nesting, for many of the interesting things are taking place inside the box. It is often said that disturbance will bring about desertion. I suppose that it might; but I have never experienced it with my own, much interfered with, stock. Indeed I have found that my frequent examination has often helped to avoid catastrophe by detecting ailing or dead chicks, etc. Most people hang boxes inside the flight. When these are examined it does create considerable disturbance. I overcome this by clamping mine to the outside—the birds enter through a hole cut in the wire where it passes over the entrance hole. Examination is easy and quick; the difficulty I find is getting the hens off the nest—I prefer to wait till the female is in the flight, or shelter, before taking a peek. Some hens need shooing or others refuse to budge and eggs or chicks have to be seen when the incubating hen attacks or moves away flightily from the examining hand.

Chicks in vertical-sided and deep boxes—even when these are fitted with a good “ladder” or wire mesh—sometimes die with ruptured livers damaged by the parents dropping the last few inches of their descent on the backs of the chicks. With my Cockatiels the mortality, from ruptured livers, was extremely high (50% of five clutches) using boxes with the nest floor more than 18 in. from the entrance hole. Chicks move away from the light once the eyes open and the parents also lay in the dark part of the chamber. In short boxes this would mean that clutches are generally not immediately under the hole, whereas in tall boxes this area is dark enough for nesting. Because of this danger all my boxes are now hung on the slope. The “ladder” which allows the parrot to climb from the hole to the bottom of the box is important. e.g. staples, part knocked in, to form two parallel rows (similar to the illustration in Groen 19) proved impossible for Cockatiels—they are not particularly good climbers. Wire mesh is certainly the best “ladder” for vertical boxes. With sloping boxes the “descending” side has cross spars of branch segments or soft timber as steps.

It is difficult to prove but I do believe that parrots nest more readily in cramped rather than spacious boxes. Hardy (1963 p. 188) writes “most species of bird that dig their own nest cavities make them barely large enough to accommodate only one adult and the eggs or young. This is certainly the case in some parrots, such as *Amazona finschii*. These cavities are occasionally so small that it is difficult to believe that an adult bird could incubate the eggs or brood the young therein”. Several

nesting accounts in the literature show parrots—given a choice—selecting small box. e.g. David West writes (1957) of Pileated parakeets *purpureicephalus spurius* that “instead of taking one of the two large boxes especially hung for them at the rear of the aviary the hen chose the nest-box intended for the pair of Tourquoisines. This was not large box, being about 12 inches high, eight inches deep, and six inches wide”. The most successful breeder of Grass-parakeets known to myself—the late Mr. W. Drake of Eye, Peterborough—used boxes only three or four inches square at the base. I built an experimental box so that rain could percolate through at the base so the mould on the bottom, taken from a decaying willow, was always moist and sometimes very wet. Amazingly the parent Cockatiels did not desert and five chicks were reared. They all had such swollen tarsal joints that the “corns” constricted the leg beneath the closed rings and the rings had to be cut away. These were also the smallest Cockatiels bred that year. With waterproof boxes I have not found chicks to have bad feet. Handfuls of wood-shavings, recommended by some American breeders, seem to delay nesting until they are removed or have been chewed down into smaller pieces. I now use nothing but bare, wooden “concaves” such as are used by Budgerigar breeders.

Conures—*Aratinga*, “*Nandayus*”, “*Leptositta*”, *Rhynchopsitta*, *yanoliseus*, “*Ognorhynchus*”, *Pyrrhura*, “*Microsittace*”, “*Enicognathus*” *Myiopsitta*,—many of the Macaws—*Ara* and *Anodorhynchus*—and Caiques use the nest-box as a dormitory, by both sexes, even when not breeding. These birds enter boxes readily—often within minutes of putting boxes up. Roosting “Conures”—see above list—avoid any soiling of the nest by retaining faeces over the night. However the American parakeets—“*Amoropsitta*”, *Bolborhynchus*, *Brotogeris*, and probably “*Psilopsiagon*” and “*Nannopsittaca*” are less inclined to roost in a nest-box. It often takes many weeks before they dare to enter and when they do sleep within, unless incubating, they stay in the entrance and are not “continent” so they foul the entrance. Parrotlets *Forpus* probably are the same (my observation of these is rather equivocal—they do not roost in a box unless about to breed; but they seem always to be house-trained”). All the other American parrots use the box solely for breeding purposes, e.g. *Amazona*, *Pionus*, *Pionopsitta*. In the Old-world some of the Red-billed group—Lovebirds and *Psittacula* parrots of both sexes—may use the nest as a dormitory. With most Red-billed parrots and New Zealand parakeets it is the hens that sleep in the box when not breeding, as may odd Rosellas *Platycercus* spp.. Lories sleep in pairs in the box whether breeding or not. When nest-selecting or building New-world parrots seem to engage one sex as much as another. In Red-billed parrots the hen seems to do all of the work. In Broadtails the male does nothing to the nest but seems to prefer to indicate the site. Cockatoos have nesting as a joint venture.

Eggs

All parrots lay white eggs. They are small for the size of the bird. From my own measurements most eggs weigh so proportionately little that it takes 12–15 to add up to the weight of the laying hen. They vary somewhat in shape, even in parrots of the same species—generally they are “oblong” rather than “egg-shaped”. The average size of the clutch varies from: one, two, three—up to seven, eight or nine, and is roughly the same for each species. There seems to be a definite relationship between the protein availability of the wild diet and the genetic size of the clutch: Lories and Lorikeets (Loriinae) utilise pollen from flowers as their major source of protein. Pollen granules have walls that are most resistant to digestion and only a small proportion of this—theoretically rich—source of protein can be extracted by the gut. The Cockatoos that obtain much of their food from trees—as berries or nuts—lay one egg—Palm Cockatoos, Black Cockatoos. Gang-gang *Callocephalon fimbriatum* and the white island Cockatoos also lay smallish clutches. Whereas those Australian cockatoos that feed from the ground and whose breeding seems to be governed by the massive build-up of grains and vegetable storage-organs—rhizomes, bulbs, corms, and tubers—following irregular rainy periods, lay large clutches of three to five eggs.

A case for a relationship between the genetic determination of clutch size being connected with food source is demonstrated by the Broadtail (*Platycercinae*). Swift parrakeets *Lathamus discolor*, depend largely on the same flower-garnered diet as Lorikeets—supplemented with insect (Forshaw 1969)—have three, *four* or rarely five eggs. New-Zealand parrakeets have the most versatile feeding behaviour of the sub-family—they have extended their omnivorous diet because they can scratch with the feet like a domestic hen and turn over soil and vegetation. Many potential-breeding females of other genera, e.g. African Greys *Psittacus erythacus* and Asiatic Ringnecks *Psittacula* spp. scratch floor litter. This is never done by males and is exclusive to females only in the breeding season—though Holyoak (1972) suggests that this may not be seasonal—New-Zealand parrakeets have emancipated this behaviour—which is then adopted by females cleaning out nest cavities—from being exclusive to nesting females for *both* sexes foot-scratch the litter.

In captivity an increase in the richness of the food supplied seems capable of increasing slightly the general clutch size. Lories and Lorikeets usually lay two eggs. Ken Russell (1971), when writing about his (first reported) breeding of Perfect Lorikeets *Trichoglossus euteles* remarked that the clutch of three eggs seemed to be unique in the aviculture records. Though not reported this may not be so uncommon for captive *Trichoglossi*. Mr. Ray Kyme has once had a clutch of three with his Weber's (*Pers. com.*) and Mr. A. Marques (*Pers. com.*) found that three eggs seemed invariable for his three breeding pairs of some sub-species of *T. haematod* kept together in a breeding aviary. Mr. Russell's Perfect

id three eggs with their second clutch (*pers. com.*). Animal protein—ilk—may be partially responsible for these large clutches.

Parrots are "determinate layers", i.e. egg laying is not continued beyond the regular clutch size if they are removed as laid. However have noted with my own parrots that when a hen starts to incubate with the first or second egg then the clutch is small to average in size. However when delayed until several eggs have been laid then the clutch is often larger than average. Not uncommonly captive parrots lay abnormally large clutches—far too large for the hen to cover—often no attempt is made to brood and the process sometimes kills the hen.

Generally eggs are laid at two day intervals—plus or minus a few hours. Forshaw (1969) says that Bourke's grass-parrakeet *Neophema bourkei* lay on consecutive days. This is not so for "European" Bourkes and Mr. Alan Lendon (*in cor.*) says that, in his experience, captive "Australian" Bourke's lay on alternate days. If food is suddenly reduced in quantity (personal observation of captive birds) an expected egg may not be realised; if the food is then increased or restored egg laying is often resumed. My surviving Black-headed Caique hen lays on alternate days in the summer and every three days in the winter.

Incubation

In order that I might more accurately determine the length of incubation which I take to be the shortest interval between laying and hatching—mark all eggs as laid with an indelible felt-tipped pen. Sometimes it is not possible to mark eggs in sequence, when this is so all non-marked eggs are given the same number. Weighing of eggs and chicks is done with a "Pesola" spring balance). Incubation almost invariably starts before completion of the clutch so that sequential hatching takes place. Incubation is exclusive to the hen except for most Cockatoos (which, of course, includes the Cockatiel), where the male, pigeonwise, takes over most of the daytime incubation. Male Black Cockatoos of the genus *Calyptorhynchus* are said not to incubate (see Forshaw 1969). This is not invariable Mr. G. S. Mottershed, of Chester Zoo, tells me that his breeding pair of Yellow-tailed Black Cockatoos *C. f. funereus* share duties exactly as other Cockatoos. It is my impression that further observation will show that shared incubation is the rule with *all* Cockatoos.

Before laying most parrot hens spend much time in the box brooding removing powdery litter and trying to line the cavity with splinters of wood. Some hens seem unable to lay yet go quite broody and they will "adopt" eggs and hatch them successfully.

Chicks

Incubation varies from 17 days in *Forpus* parrotlets. Budgerigars take 18 days. Platycercines all seem to take 19 days, as do Cockatiels (*pers. ob.*), whereas Lories take about 26 days, Conures 27 days. The egg shells are

generally left in the nest cavity where they break down with the movement of the birds. Some Cockatiels carry shells out of the nest to drop them some way off. I have not noticed this with other parrots. When hatched chicks are extremely helpless. Most are clothed with down yet some of the Red-billed parrots are practically naked: Eclectus chicks have short 1-2 mm. thick, orange-yellow bristles and Indian Ring-neck (Smith 1972) are also "bald". It is said by Marchant (1960) that *Forpus* parrotlet chicks are naked—they are not. The sparse down that covers them at birth gets somewhat abraded as they grow and by a week some may be almost bald. Budgerigar chicks are downed in the egg but hatch naked (Smith 1972). Some chicks are exceptionally woolly—Kakas and Keas *Nestor meridionalis* and *notabilis* are very thickly downed. New-Zealand parrakeets also have rather thick down for Broadtails.

Colour of down differs and is, I think, yellow in all Cockatoos and white or pale grey in the New World parrots. The eyes of young parrots are sealed for the first week or more of life. Like puppies, or kittens the ears of New World parrots are sealed-off when hatched, the Old World parrots have open earholes at hatching. Mr. Thomas Brossett, of Sweden at my request for some information kindly forwarded some excellent photographs of the head of a week-old parrotlet chick and he notes in the accompanying letter that though they have sealed ears the Senegal parrot *Poicephalus senegalensis* chicks that he bred and photographed had open ears—as do all the other chicks he has inspected. The earhole opens after the eyes—say at a fortnight to three weeks old—for most American parrots.

Another unique and seldom mentioned fact is that most Neotropical parrots have a padded swelling on the upper and lower bill (Smith 1971). This is barely perceptible in *Forpus* parrotlets on hatching and later merely indicated by the bill being just slightly wider than any Old World parrot. Born as they are in the near or absolute dark parrot chicks have pale yellow or white bills and all seem (except for *Forpus* parrotlets—where it may be at too high a wave-length to be audible) to utter a tiny, thin noise when disturbed by movement. Chick sounds seem to be made with expiration only—birds, as anyone knows who has listened to the incessant song of canaries, can make noises both when inhaling and exhaling. I believe that in the absolute or near-darkness of its nest chicks are fed by the parents "homing" to this peeping noise. The adult bird when moved would cause the chick to call out. This causes the parent to take its bill into her own. A slight pressure on the side of a chick's bill starts its head jerking which makes the parent to regurgitate.

To assist in this feeding certain developments have taken place. First the nape of the chick's neck is enormously muscled and is quite the largest visible muscle on hatching. Young parrot chicks are often said to be fed on "crop milk" like a pigeon squab. A chick's bill (or come to that a female parrot being fed by her mate) is held "inside" the parent's bill.

and looks extremely "pigeon-wise"; but the food fed is not crop-milk. They are fed on part digested, part softened, food direct from the parent's crop and which probably includes secretions from the enlarged proventriculus—first stomach—of the hen (T. G. Taylor not published). A very good description of an African Grey feeding a fostered Amazon (Vane 1957) explains that very young chicks seem to get more "gravy" than solid food. However post-mortem examination—and looking at the contents of the transparent crops of baby parrots—convince me that the largest part of the diet is regurgitated crop-softened food. There is a need for grit—to enable the chick's gizzard to function correctly. If the largest visible muscle is that of the neck, the largest absolute muscle is that forming the gizzard of the infant which is about 5% of its total body weight. At about the time that the chicks start to hatch male parrots may be seen searching the ground for grit though at other times—especially with arboreal parrots—they may never have been previously seen on the floor. The male, except for Cockatoos, does not feed the chicks directly for several days then he feeds the hen and then she feeds the chicks. Often seeds or foods are taken that at other times are ignored such as millet spray and bread and milk. Mortality is high in young chicks at the point of hatching and again when the hen ceases to brood and goes foraging with the male for food.

As the interval between successive eggs is usually two days, and incubation generally starts before completion of the clutch a considerable difference in size and development often exists between the eldest and youngest chicks. The eldest may be half-grown in weight, with open, seeing eyes capable of maintaining body heat, thickly covered with sprouting feathers and able to run up to the parents, as they enter the box, to solicit feeding. Sharing the nest—and available food—will be graduations of younger chicks of which the last hatched is blind and completely helpless and submerged completely under its larger brothers and sisters. Yet when food is sufficient losses are not too frequent.

There is a quite noticeable difference in voice-tone between the different ages of chicks. It is possible that the noise made by the very youngest chicks has more "allure" than that of the eldest. Unless there was some such system it is hard to understand how the parents can cope with such a variety of different-sized babies. Parrot-chicks lie with the heads interlocking so that if one is fed it must stimulate all the adjacent chicks—perhaps this also helps even distribution of meals.

Two sorts of growth patterns are seen in parrots. The first—seen in budgerigars, Cockatiels and Broadtails is for a continual, though gradually tapering, increase of weight until they fledge—when the chick weighs less than the parents. The second is for a rapid increase in growth—during which the chick may come to weigh more than the parents—followed by a long period of stationary weight as the feathers grow then loss of weight just before they leave the box. This is seen in all the

American parrots that I have examined. Poor feeding delays fledging, e.g. Cockatiels usually leave the nest when about five weeks old. If the parents are poor feeders they may delay until a week older and if the parents are good feeders they may fledge when four weeks old. Once they leave the nest some parrots seem almost independent of the parents, or can survive by feeding themselves; e.g. parrotlets, Broadtails, Lovebirds, African Greys. Whereas some, such as Cockatoos, seem dependent on the parents for very long periods. Caiques when fledged beg and when being fed flap wings like baby sparrows. Young Cockatiels head-bob when pleading to be fed.

After fledging some chicks return back to the box to sleep—Ringnecks, Conures. Broadtails may for a day or so and then relinquish the habit. *Forpus* parrotlets are said to be intolerant of their offspring once they leave the box and are supposed to kill them—mine don't. Broadtails soon become intolerant of their young. Red-bills and South American parrots seem to form happy contented family parties.

REFERENCES

- ALLCROFT, W. M. 1964. *Incubation and Hatching Practice*. Min. of Agric. bulletin no. 148. London H.M.S.O.
- CARTER, T. C. & FREEMAN, B. M. 1969. The fertility and hatchability of the hen's egg. *British Egg Marketing Board Symposium No. 5* Edinburgh.
- DEURER-BURY, C. 1972. Zucht des Grunzugelpapageis. *Die Gefiederte Welt* 96: 1-5.
- FORSHAW, J. M. 1969. *Australian parrots* 269. Melbourne: Lansdowne Press.
- GROEN, H. D. 1964. *Australian Parrakeets* 233. Holland: Privately printed.
- HARDY, J. W. 1963. Epigamic and Reproductive behaviour of the Orange-fronted parrakeet. *Condor* 65: 169-199.
- HEY, D. 1967. Report on the breeding of the Red-cheeked Lovebird. *Avicult. Mag.*, 73: 121.
- HOLYOAK, D. M. & D. T. 1972. Notes on the Behaviour of African Parrots. *Avicult. Mag.*, 78: 88-95.
- JACKSON, T. R. 1963. The nesting of Keas. *Notornis* 10: 319-326.
- JOHNSON, A. W. 1967. *The birds of Chile*, Vol. 2. 447. Buenos Aires.
- LUKE, L. P. 1952. *Lovebirds and Parrotlets*. 101. London: Cagebirds.
- MARCHANT, S. 1960. The breeding of some S. W. Ecuadorian birds. *Ibis* 102: 363-364.
- PERREAU, G. A. 1909. Hanging parrakeets, *Bird Notes* 7: 276-278.
- PERRY, J. 1959. Breeding the Red-faced Lovebird in South Africa. *Avicult. Mag.*, 65: 119-123.
- POWER, D. M. 1967. Epigamic and Reproductive Behaviour of Orange-chinned Parrakeets in Captivity. *Condor* 69: 28-41.
- PRESTWICH, A. A. 1957. Breeding of the Red-faced Lovebird. *Avicult. Mag.* 68: 1-7.
- PRESTWICH, A. A. 1967. The Sierra Parrakeet. *Avicult. Mag.* 73: 179-182.
- RUSSELL, K. 1971. Breeding of the Perfect or Plain Lorikeet. *Avicult. Mag.* 77: 115-116.
- SMITH, G. A. 1971. Black-headed Caiques. *Avicult. Mag.*, 77: 202-218.
1972. Indian Ring necks. *Avicult. Mag.*, 78: 120-137.
- TAVISTOCK. 1927. Parrakeet Nesting Sites. *Avicult. Mag.* IV series V 238-243; 1929. in lit. *Avicult. Mag.*, 4th Ser., 7: 300-310; 1930. in lit. *Avicult. Mag.*, 4th. Ser., 8: 311-312.
- VANE, E. N. T. 1957. Rearing the Yellow-cheeked Amazon. *Avicult. Mag.* 63: 183-188.
- WEST, D. M. 1957. The Nesting of the Pileated Parrakeet in California. *Avicult. Mag.*, 53: 14-17.

SOME NOTES ON BREEDING THE STANLEY CRANE

(*Anthropoides paradisea*)

By J. O. D'EATH, (Monken Hadley, Herts, England)

When the waterfowl collection here was re-established in 1946 on the cessation of World War II it was my intention to extend same to include the family Gruidae. However, owing to the limiting factors of space, this original intention was unable to be fulfilled and only the following species could be kept:-

demoiselle (*Anthropoides virgo*), Stanley (*A. paradisea*), West African Crowned (*Balearica pavonina*), and East African Crowned (*B. begulorum*). In the space of 20 years or so casualties occurred but were always replaced so that true pairs were maintained.

In 1967, when my friend and fellow member of the Avicultural Society, Tom Spence moved to Australia to take up the Directorship of the Perth (W.A.) Zoo, he generously gave me an adult female Stanley Crane. This bird was very "fixated" but in spite of this I decided to endeavour to rear it. Accordingly after it had been with me for a year, I purchased in October 1968 a very fine wild-caught male from a Continental dealer. This bird was placed in an adjoining pen to the female and the birds became familiar with each other for a period of six months. In the Spring of 1969 they were put together in a pen measuring 45 m. x 20 m. which also contained a small natural pond. The female tended to be aggressive towards the male, which was of shyer disposition anyhow.

Both birds were only lightly feather-clipped on both wings and not permanently pinioned (this was intentional).

Displaying and "dancing" was noted from time to time from May onwards.

I will now turn to the sequence of events that led to the successful breeding of this species, the subject of these notes. In 1970 eggs were laid on the following dates:-

16th May	29th May	1st June	22nd June
25th June	29th June	8th July	7th August

It will be seen that a total of eight eggs were laid. The majority were removed and incubated under hens with the greatest care but all proved barren. On two occasions a goose egg was substituted but within minutes the female Stanley had eaten it. An egg painted to a fair representation of the original egg was also given the same treatment. The female on another occasion was allowed to incubate the sixth of her own eggs which she did for a week, the male bird sharing duty with her. Unfortunately, the female lays against the wire netting adjoining the path round the main waterfowl collection and whilst disturbance is minimal, they are by

disposition shy birds and I suspect the slightest disturbance may have some bearing on the egg-eating tendency. So much for the season 1970.

We now turn to 1971 and the dates on which eggs were laid is given herewith. The asterisk denotes eggs which were subsequently fertile:-

1st May 1971*	19th May 1971	5th June 1971*
7th June 1971	27th June 1971*	12 July 1971
	23rd July 1971	

Eggs and Laying Pattern

The egg is elongated and heavily mottled with dark brown streaks and blotches on a buffish brown background and weighs 190 gms. Measurements varied slightly, but the average taken over twelve eggs indicates a mean of 95.0×59.9 mm. Roberts in "Birds of S. Africa" quote 93.0×59.9 as an average taken from 60 eggs. The shell is very hard but I will comment on this under Hatching and Rearing. If one refers to the two laying tables given above, one will note that it is difficult to extract any definite pattern. One has always been given to understand that Cranes in the wild state lay only two eggs, but in 1970 it will be noted that eggs were laid on 22nd, 25th, 29th June respectively, approximately at three-day intervals. There is really no definite evidence from my own limited experience to establish any regular laying pattern and captive conditions therefore probably cannot be compared with the wild.

I have one added note of interest in my record to the effect that on 27th June 1971 I was fortunate enough to actually witness, at close quarters, the female Stanley laying. At 3.30 p.m. the bird was at the nesting site and I was actually stroking her head when she emitted a low 'purring' sound and slowly lowered herself to the ground, whereupon the egg was laid in about 30 secs. I immediately lifted the egg and the bird showed no aggression.

Hatching and Rearing

All eggs in the 1971 season were removed immediately after laying and put on the conventional sand-tray for 48 hours before being sat and turned each day. The usual foster-mother was a Black Sumatra hen but actually the first Crane was successfully reared by a Rhode Island. The incubation period is 29/30 days. If the egg is water-tested 7/10 days before hatching one will get a clear indication of fertility. The usual method of candling is ineffective, owing to the heavily marked shell. On "pipping" the egg was immediately transferred to an incubator to avoid any possible crushing or injury to the chick by the foster-mother. After hatching it was returned. The egg-shell appears to be exceptionally thick and assistance by breaking the shell was given to the emerging chick, although this may not have been necessary.

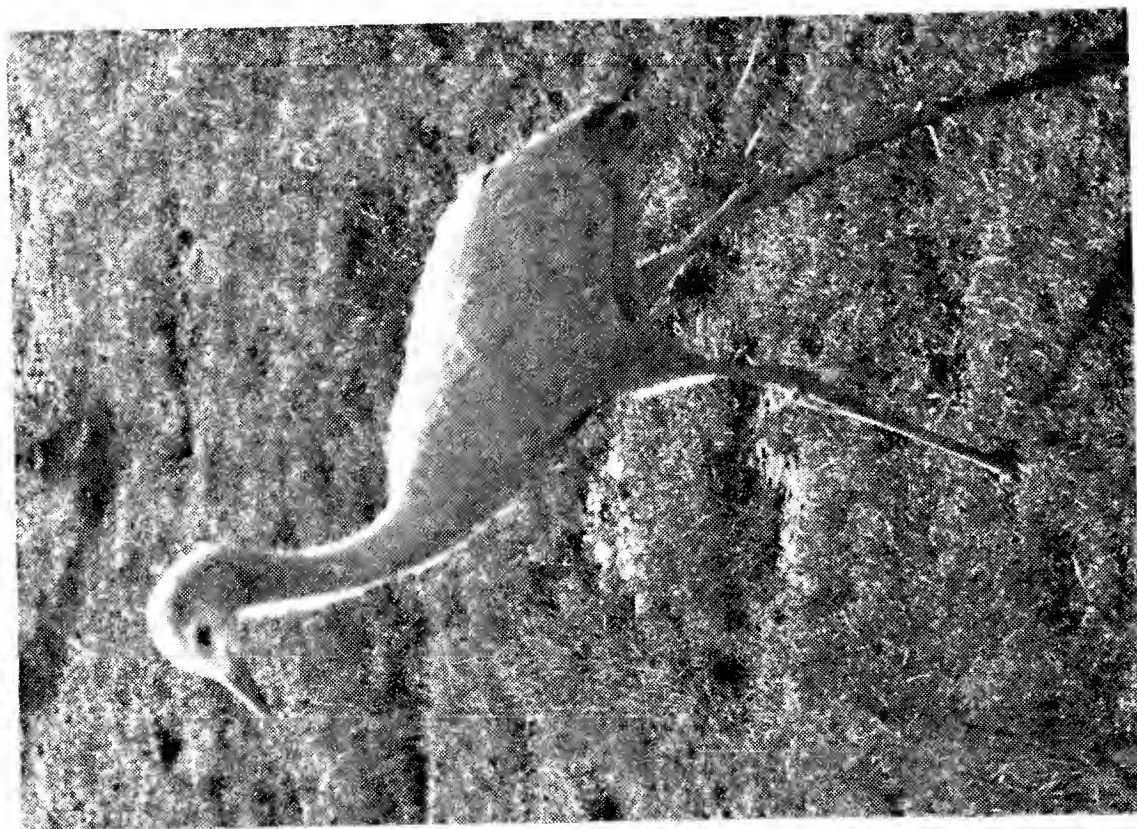


2 1/2 Weeks old

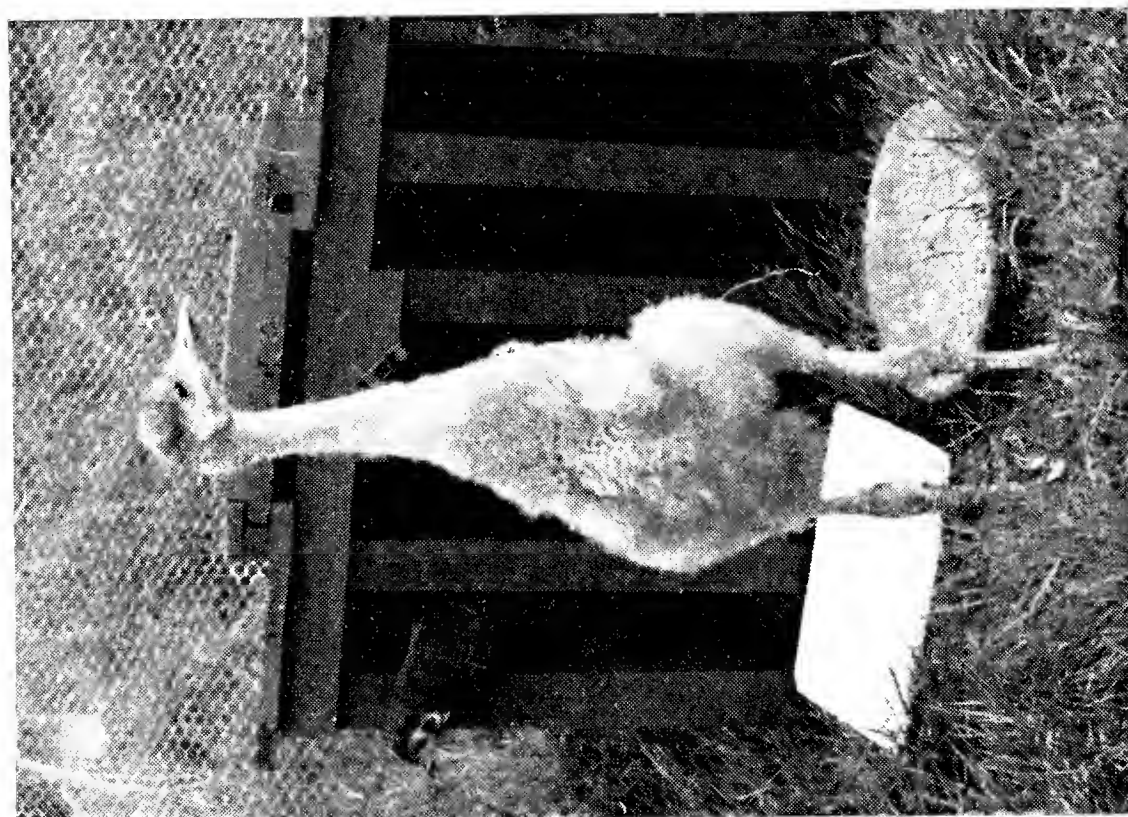
STANLEY CRANE CHICK



3 Days old



6 Weeks old



4 Weeks old

STANLEY CRANE CHICK

After the drying-off period, the chick was put with the foster-mother in the usual hen-coop inside a building. A small run was provided with pecking as the floor covering. An Infra-Red lamp was suspended at a height of 2 ft. above. For the first $\frac{2}{3}$ days the chick is not very active. A formula for a diet was worked out and the ingredients were as follows:-

Finely minced meat
Yolk of hard-boiled egg
Dried milk
Calcium Lactate
Three Drops Abidec (multivitamin)
Chick rearing crumbs + $\frac{1}{4}$ teaspoonful of Cod Liver Oil
The whole dried off to crumbly consistency with chick crumbs.

It was soon evident that the chick would not pick by itself in spite of encouragement by the hen. This was not unexpected as in the wild the female Crane feeds the chick herself for several weeks. On the third day after hatching the chick was induced to take small pieces of food from a pair of tweezers and was fed every three hours. It also started to drink from a fountain. For a few days live Mealworms were also accepted in addition to the aforesaid diet. On the seventh day, the chick was pinioned. It was not until three weeks that the chick started to pick food for itself and at this stage it was moved out of doors into a weather-proof house constructed of corrugated plastic measuring 4 ft. x 6 ft. Shortly after this it was noticed that the outside toe of the right foot was showing a "splayed" condition. The simple remedy of a match stick applied as a splint secured with adhesive tape was used and proved a completely effective cure. I was a little surprised at this trouble occurring as ample Calcium was present in the diet, but maybe some other trace element is lacking. Growth is fairly quick and at five weeks feathering is evident. The foster-mother was then removed.

I give a brief table of growth rate:-

<i>Weight</i>		<i>Height</i>			
5 gms (at birth)		2 cm at shoulders	35 cm overall	(3 weeks)	
11.85	14 days	30.25 cm „ „	55 cm „	4 „	
17	21 „	40 cm „ „	70 cm „	5 „	
23	28 „	40.27 cm „ „	70 cm „	6 „	

At six weeks the meat diet was discontinued and the young Crane was reared on to grain and poultry pellets. A second Crane was likewise reared and at 12 months they have not yet assumed full adult plumage. They would appear to be a pair. On two occasions they were given a proprietary game bird wormer as an additive in their drinking water as an antidote to any possibility of gape-worm.

Summary

It would not appear that the rearing of the species presents an unsurmountable difficulty, the main problem seems to be that one has to be fortunate in having a breeding pair. Fertility running at less than 50% is not satisfactory and obviously there is a diet deficiency in the breeding pair. I have observed on occasion my breeding pair catching the odd field mouse or vole and eating caterpillars from plants. The diet in the wild is known and in captivity where Zoos and Bird Gardens have greater facilities than the private breeder like myself, I would have thought the introduction of such items as mice and day/old chicks into the diet might well go some way to solving the problem. There is one point of interest which has emerged from my experience with these Cranes which is that they are completely hardy in our English climate and I have not found it necessary to house them in the winter. They have withstood temperatures as low as -15°F . A. F. Moody in his "Waterfowl & Gamebirds in Captivity (1932)" P. 174, says under the heading *HARDINESS*—"The most delicate of the Cranes mentioned and a species that although capable of enduring a dry cold if confined in a shed, cannot bear combined cold with damp and requires to be housed under cover from early Autumn till late Spring." The foregoing has definitely not been my experience. Finally in the light of my experience, I would say that bearing in mind our variable climate it is impractical to let the birds attempt rearing their own young and moreover, by removing the eggs one is obtaining greater productivity and thereby increasing the prospect of rearing more than two birds any one season.

Previous breedings

I am greatly indebted to the President of the Avicultural Society who has researched on the subject and writes as follows:-

"... a rare breeding and worthy of every congratulation. A Knowsley bred Stanley was included in the Knowsley sale, 1851 (see catalogue in the Library of Zoological Society, London). Mitchell (Zoo Garden Guide, 1858, P. 13) says "at Knowsley broods of this beautiful bird were hatched out on several occasions"—quite possibly they were not reared.

Ezra had complete success in 1936. Young had been hatched the three previous years but none had lived longer than a couple of weeks.

In 1936, however, one pair reared one young one and another pair two. They were two and one month old at the date of the account. Photographs are given of the young cranes.

For this success Ezra was awarded the A.S. medal (*AVICULTURAL MAGAZINE*, 1936, pp. 272, 340).

In his account Ezra says "There is a young one at the London Zoo which is three weeks younger than mine and looks like being reared".

The Zoo bird died but one was reared in 1937 (Zoo reports).

I am also grateful to Mr. Peter Olney, Curator of Birds, London Zoo, for the following information:- "In 1935 one hatched and died, in 1936 one hatched and died and in 1937 one was apparently reared. You probably know the reference that it was first bred in the U.S.A. by Jackson. This comes from Crandall's list in the N.Y. Zoo Soc: 1917: 1449. There is also a reference to a Stanley X White-necked crane successfully reared at Woburn in the AVICULTURAL MAGAZINE, 1920, p. 167."

From the foregoing it would appear that *A. paradisea* has not been bred in this country for 34 years.

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RECORDS OF FIRST BREEDINGS UNDER CONTROLLED CONDITIONS IN BRITAIN

PART I

By C. J. O. HARRISON (Berkhamsted, Herts, England)

In 1926 Dr. E. Hopkinson published his "Records of birds bred in captivity"; and from time to time in later years he published further additions to this list of breeding in all parts of the world. These later lists appeared in the AVICULTURAL MAGAZINE, the last being in 1944. Apart from the information on parrots and birds of prey compiled by A. Prestwich, we have had no more recent lists and it has become increasingly time-consuming to trace evidence of what has or has not been bred under captive conditions.

To assist enquiries to the Society concerning possible first breedings I have been compiling a list of first breedings in Britain, and I hope to add, over a period, a brief checklist of references to such breedings. These mostly refer to AVICULTURAL MAGAZINE records, but I have included other references where these have come to my notice. The task has not been made any easier by the changes in both English and Latin names of species over the years, nor by the fact that what were previously separate species have, in some instances, been combined into single species.

I have not been able to allow this work the time I would like to have devoted to it. I hope that readers will bring to my attention any errors or omissions. I have used a reversed sequence of Peters' "Checklist of birds of the world" for the family order.

Abbreviations used in the list are;

A.M.—AVICULTURAL MAGAZINE.

B.N.—the journal of the Foreign Bird Club, 1903–1924.

I.Z.Y.B.—International Zoo Yearbook.

Hopkinson, 1926.—E. Hopkinson's "Records of birds bred in Captivity"

L.Z. Repts.—London Zoo Reports.

Occ. Publ. A.S.P.E.B.A.—Occasional Publications. Association for the study and propagation of European birds in aviaries.

In most other instances titles are given in full.

CROWS. (*CORVIDAE*).

RAVEN, *Corvus corax*. W. H. St. Quintin. *A.M.* (1904): 292–293.

RED-BILLED CHOUGH, *Pyrrhocorax pyrrhocorax*. R. K. Abbeyville. *Cage Birds* 7 July 1960; 9. also Paignton Zoo. *I.Z.Y.B.* 12 (1970): 140–141.

ALPINE CHOUGH, *Pyrrhocorax graculus*. P. Wayre. Norfolk Wildlife Park. *A.M.* 76 (1970): 320–321.

YELLOW-BILLED MAGPIE, *Pica nuttalli*. A. Ezra. *A.M.* (5) 2 (1932): 257–258.

SOUTHERN TREE-PIE, *Dendrocitta leucogaster*. Winged World. *A.M.* 76 (1970): 144–145.

AZURE-WINGED MAGPIE, *Cyanopica cyanus*. Eastern race, London Zoo 1884. *vide* Hopkinson 1926. Western race, London Zoo 1884. *vide* Hopkinson 1926. Also P. Wayre *A.M.* 76 (1970): 240.

OCCIPITAL BLUE PIE, *Urocissa erythrorhynchus*. M. Amsler. 1915. *A.M.* (3) 6 (1915): 367–373. *B.N.* 1915: 294–316.

JAY, *Garrulus glandarius*. D. Goodwin. *A.M.* 55 (1949): 132–133.

LANCEOLATED JAY, *Garrulus lanceolatus*. D. Goodwin. *A.M.* 60 (1956): 154–162.

LOO-CHOO JAY, *Garrulus lidthi*. T. C. Oliver. *A.M.* 70 (1964): 212–213.

MEXICAN GREEN JAY, *Cyanocorax yncas*. Jersey Zoo. *A.M.* 77 (1971): 20–22.

SCRUB JAY, *Aphelocoma coerulescens*. W. R. Partridge. *A.M.* 71 (1965): 76–77.

STELLAR'S JAY, *Cyanocitta stellari*. D. H. S. Risdon. *A.M.* 66 (1960): 206–208.

BIRDS OF PARADISE. (*PARADISAEIDAE*).

SUPERB BIRD OF PARADISE, *Lophorina superba*. Chester Zoo. *A.M.* (1968): 170–172.

PRINCESS STEPHANIE'S BIRD OF PARADISE, *Astrapia stephaniae*. London Zoo. *A.M.* 75 (1969): 50–51.

BOWERBIRDS. (*PTILONORHYNCHIDAE*).

REGENT BOWERBIRD, *Sericulus chrysocephalus*. R. Phillipps. *A.M.* (2) 4 (1905-6): 51-68, 88-96, 123-131.

WOODSWALLOWS. (*ARTAMIDAE*).

WHITE-BROWED WOODSWALLOW, *Artamus superciliosus*. E. J. Brook. *A.M.* (2) 6 (1907-8): 299. *B.N.* 1909: 183, 208.

MUD-NEST BUILDERS. (*GRALLINIDAE*).

MAGPIE LARK, *Grallina cyanoleuca*. A. Ezra. *A.M.* (4) 6 (1928): 233-234.

STARLINGS. (*STURNIDAE*).

GREATER HILL MYNAH, *Gracula religiosa*. Keston Foreign Bird Farm. *A.M.* 63 (1957): 160-162. 64 (1958): 38-39.

SOUTH INDIAN HILL MYNAH, *Gracula (religiosa) indica*. B. Bertram. *A.M.* 75 (1969): 173-176.

GOLDEN-CRESTED MYNAH, *Ampeliceps coronatus*. W. R. Partridge. *A.M.* 71 (1965): 128-129.

INDIAN MYNAH, *Acridotheres ginginianus*. London Zoo. *L. Z. Repts.* 1909.

COMMON MYNAH, *Acridotheres tristis*. London Zoo. *L. Z. Repts.* 1905.

ROTHSCHILD'S MYNAH, *Leucopsar rothschildi*. A. Ezra. *A.M.* (4) 9 (1931): 305-307.

BLACK-WINGED STARLING, *Sturnus melanopterus*. London Zoo. *L. Z. Rept.* 1922.

ARDON'S STARLING, *Sturnus burmanicus*. R. Franklin. *A.M.* 78 (1972): 11-13.

BLACK-NECKED STARLING, *Sturnus nigricollis*. A. E. Hall. *A.M.* 76 (1970): 6-8.

OTLESS STARLING, *Sturnus unicolor*. K. Semple. *A.M.* 77 (1971): 166-167.

COMMON STARLING, *Sturnus vulgaris*. T. S. Thomson. *A.M.* 55 (1969): 241-242.

SY PASTOR, *Sturnus roseus*. G. H. Gurney. *A.M.* (4) 12 (1934): 77, 300-301.

KEY STARLING, *Sturnus sericeus*. A. Ezra. *A.M.* (4) 13 (1935): 214.

GODA STARLING, *Sturnus pagodarum*. R. Farrar. *A.M.* 7 (1901): 197-199.

DAMAN STARLING, *Sturnus erythropygius*. R. Farrar. *A.M.* 7 (1901): 192-196.

- MALABAR STARLING, *Sturnus malabaricus*. R. Farrar. *A.M.* 7 (1901): 13-17.
- WATTLED STARLING, *Creatophora carunculata*. P. H. Brown. *A.M.* 7 (1971): 158-159.
- SPOTTED-WINGED STARE, *Saroglossa spiloptera*. Mrs. K. M. Scamell. *A.M.* 75 (1969): 262-265.
- ROYAL STARLING, *Cosmopsarus regius*. Lady Wavertree. *A.M.* (4) (1930): 305-306, 327.
- SHELLEY'S STARLING, *Spreo hildebrandti*. Mrs. K. M. Scamell. *A.M.* 70 (1964): 198-200.
- SUPERB SPREO, *Spreo superbus*. A. Ezra. *A.M.* (4) 2 (1924): 168.
- WHITE-CAPPED STARLING, *Spreo albicapillus*. A. Ezra. *A.M.* (4) (1929): 175-176.
- MAGPIE STARLING, *Speculipastor bicolor*. W. R. Partridge. *A.M.* 7 (1964): 195-198.
- AMETHYST STARLING, *Cinnyricinclus leucogaster*. M. Amsler. *A.M.* (4) 13 (1935): 295-300.
- RÜPPELL'S STARLING, *Lamprotornis purpureopterus*. A. Ezra. *A.M.* (4) 11 (1933): 357-358.
- GREEN GLOSSY STARLING, *Lamprotornis chalybeus*. G. W. Thompson. *A.M.* (4) 8 (1930): 235-236.
- PURPLE-HEADED GLOSSY STARLING, *Lamprotornis purpureiceps*. T. Thomson. *A.M.* 75 (1969): 6-8.
- PURPLE GLOSSY STARLING, *Lamprotornis purpureus*. London Zoo 187 *vide note*. *A.M.* (4) 10 (1932): 228. W. D. Parker. *A.M.* (4) 10 (1932): 228.
- CROWNED STARLING, *Onychognathus salvadorii*. A. Ezra. *A.M.* (4) (1931): 305-307.
- ASIAN GREEN STARLING, *Aplonis panayensis*. London Zoo (J. Yealland). *A.M.* 63 (1957): 170.

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OBSERVATIONS ON THE PRE-MATING BEHAVIOUR IN THE ANDEAN EMERALD AND THE GOLDEN-TAILED SAPPHIRE HUMMINGBIRDS

By A. J. MOBBS (Walsall, Staffordshire, England)

I first witnessed the behaviour described in these notes, five years ago in the Spring of 1967. A few months previously, I had moved to my present address and, as I once again had sufficient room to keep hummingbirds (I had been without them for some months, due to lack of space), decided instead of housing them in cages as I had always done in the past, I would attempt to keep them in a large indoor flight. Perhaps I should point out that from the beginning, only hummers of Emerald size and above were housed in this flight; tiny species, being difficult to acquire, have always been housed in roomy cages.

The flight, 18 ft. long by 2 ft. 6 in. wide by 6 ft. 2 in. high, was duly stocked. Initially, four species of hummingbirds, a pair of Purple Martins (*Nectarinia asiatica*), a Yellow-naped Ixulus (*Ixulus flavicollis*) and a Goldcrest (*Regulus regulus*), were released into the flight. Although this does not concern the subject of these notes, perhaps I should mention that the mixing of other species of birds with hummingbirds, proved successful and two months after the initial stocking of the flight, all the hummers were removed.

The housing of hummingbirds in a communal flight has proved to be entirely successful. I have not overstocked the flight, neither have I understocked it. I consider six hummers to be the minimum and ten the maximum.

One of the original occupants, which is still with me, is a male Andean Emerald (*Amazilia franciae*). Originally a pair were introduced to the flight. The male, however, proved so aggressive towards the female that I eventually parted with her. Since parting with this bird, I have housed one other female in the flight—a Black-tailed Trainbearer (*Amazilia victoriae*)—as I have found it advisable to house batchelor males in such quarters.

Before parting with the female Emerald, the following observations were made: both birds moulted out soon after purchase and a couple of weeks before this was completed, the male commenced to sing. I believe members of the genus *Amazilia* are extremely vocal; the six species I observed regularly have been anyway. All the species have a similar song pattern, which is usually heard while the bird is perched. Occasionally, however, a bird will sing when in flight and also when displaying. Prior to the pre-mating behaviour mentioned in these notes, the Andean Emerald would sing more exuberantly than usual, the bill being opened wide and the song poured out almost without a break

between each phase. This song is extremely loud, especially for hummingbird.

Although the male often sang when perched several feet from the female, it was obvious the song was being directed at her. When the song reached a certain pitch, the male would become most agitated. He would then leave the perch and fly towards the female, wings beating very much faster than in normal flight. If this initial burst of activity was not enough to persuade the female to leave her perch, the male would bombard her from all directions, uttering shrill cries of protest. It would not take many seconds before such an onslaught persuaded the female to leave her perch, and when she did, the male would chase after her. At such times, it was always the female who tired first and when she eventually settled on a perch again, the male would hover beneath her, taking hold of her downy vent feathers in the tip of his bill, and would then hang suspended for ten to twenty seconds at a time. This procedure caused the female much distress and often she would leave the perch while the male still suspended from her vent feathers. If this occurred, the male would be towed along behind, until eventually the female became exhausted and fell to the ground. More often than not, the male would still persist in holding on to the female's vent feathers and both birds would remain on the ground for a few seconds as if in a trance.

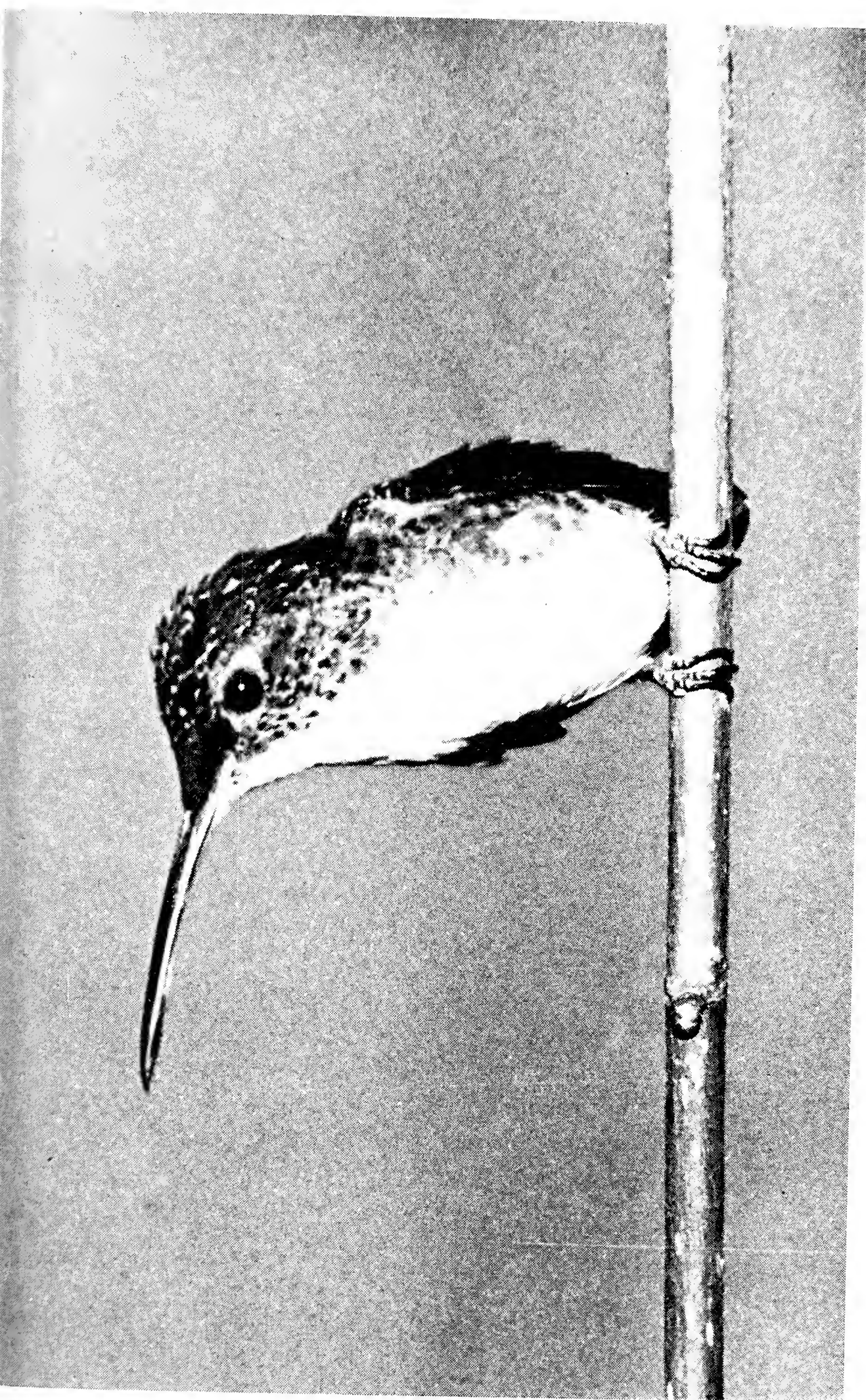
On occasions, I observed the female trying to dodge the male, or, if he had already taken hold of her vent feathering, trying to dislodge him by flying into a plant (I have a number growing along the back wall of the flight). Sometimes this ruse would be successful, but more often than not, the male would still be in tow when the female emerged from the plant.

At no time did I witness the male Emerald attempting to mate with the female, and although I presumed the behaviour mentioned, to be a prelude to mating, I could not be sure at the time.

These attacks on the female became more vicious as the male came into full breeding condition and because of this, I reluctantly parted with the female Emerald.

With the departure of the female, the male turned his attentions to other members of the flight. He was unable to intimidate any of these, however, and for a time peace reigned. In fact it wasn't until I purchased a male Long-billed Starthroat (*Helimaster longirostris*), that I again witnessed the pre-mating behaviour of the Andean Emerald.

Long-billed Starthroats, although largish hummingbirds, are normally docile and rarely attack other hummers. The Andean Emerald provoked the Starthroat from the beginning and although the latter seemed able to defend itself at first, it was not long before the Emerald dominated it to such an extent as to make its life a misery. Often my wife or I would enter the birdroom and find the Starthroat clinging to the wire netting with the Emerald attacking it unmercifully. This could not be allowed.



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MALE ANDEAN EMERALD HUMMINGBIRD (*Amazilia franciae*)

[A. J. Mobbs



Copyright]

[A. J. Mobbs

MALE GOLDEN-TAILED SAPPHIRE HUMMINGBIRD (*Chrysuronia oenone*)

to continue and I parted with the Starthroat, albeit reluctantly, as I am particularly fond of this species, finding it to have great character and a quiet form of beauty.

Before parting with the Starthroat, the following observations were made: The Andean Emerald chased the Starthroat in the same way as it had the female Emerald. The Starthroat, not being so agile, soon became exhausted and was forced to settle either on a perch or on the wire netting. Directly this happened, the Emerald would take hold of the Starthroat's vent feathers. After being suspended from these feathers for ten to 20 seconds, the Emerald would fly up on to the Starthroat's back and go through the actions of mating. After attempting to mate, the Emerald would fly to a perch and commence to preen.

Almost three years were to pass before I once again witnessed this behaviour in the Andean Emerald. In October, 1971, I purchased an immature male Golden-tailed Sapphire (*Chrysuronia oenone*), and an adult male Long-billed Starthroat. Both birds were well-fleshed and free from disease and were released into the flight almost immediately. The Starthroat was unable to fly more than a few feet at a time, due to the two outer primaries on each wing being badly frayed. I had my doubts as to whether this bird would be suitable for inclusion in the flight until it had moulted. It moved about reasonably well, however, and as it seemed content, I allowed it to remain. I fully expected the Andean Emerald to cause a certain amount of trouble, but as he was now at least five years old, I hoped he would not prove quite so vicious as when first purchased. Also placing two new additions into the flight, would I hoped, confuse the Emerald somewhat.

The Sapphire proved to be extremely agile and more often than not was able to out-fly the ageing Emerald. If the Sapphire did become fatigued, it would take refuge in a plant and the Emerald would then give up the chase.

As the Starthroat was unable to fly correctly, the Emerald naturally paid more attention to this bird than the Sapphire. The Emerald did not become so agitated with the Starthroat as it has done with the female Emerald, and because of this, would perform the pre-mating behaviour in a more leisurely manner. As the Starthroat was loath to take to the wing unless it became absolutely necessary, the Emerald was able to hover beneath it for three or four seconds before taking hold of the vent feathers. The Emerald would, on occasions, peck at the Starthroat's vent a number of times before taking hold of the downy feathers. Once it did take hold of these feathers, it would hang motionless, with wings opened wide, and would sing a subdued version of the normal type song. After fifteen seconds or so, the Emerald would release its hold on the Starthroat's feathers and fly up on to the bird's back and attempt to mate. Occasionally, while attempting to mate, the Emerald would take hold of the Starthroat's head and neck feathers.

During the procedure described, the Starthroat usually remained passive, although on occasions it did attempt to fend off the Emerald with its bill. My wife did on one occasion, witness the Starthroat taking hold of the Emerald by the throat feathers. Only once (to date) has the Emerald become so agitated as to turn vicious with the Starthroat. When this occurred, the Emerald pierced the latter's throat, drawing a considerable amount of blood.

At the time of writing, the male Golden-tailed Sapphire, has been performing the pre-mating behaviour described for the Andean Emerald for a week or so. As already mentioned, this Sapphire was immature when purchased. Shortly afterwards, it commenced to moult into adult plumage and a couple of weeks before this was attained, I observed the Sapphire attempting to mate with the Starthroat. At first the Sapphire did not take hold of the Starthroat's vent feathers, but would fly directly on to the latter's back. The Sapphire now follows the behaviour pattern already described, with one slight difference. After attempting to mate with another hummer, the Emerald has always retired to a perch and commenced to preen; the Sapphire will again take hold of its victim's vent feathers after an attempted mating and will in fact go through this procedure a number of times before retiring to a perch to preen.

The tables have now been turned on the Emerald as the Sapphire has on occasions, turned its attentions towards the former as well as to the Starthroat. The Sapphire has in fact occasionally succeeded in suspending itself from the Emerald's vent feathers, much to the latter's disgust. Both the Emerald and the Sapphire have on occasions turned their attentions to other members of the flight. They have not, as far as I am aware, succeeded in attaching themselves to the vent feathers of the birds, however.

As the Emerald was not seen to attempt a mating with the female Emerald and yet was seen to do so with both Starthroat's; could it be that the "victim" has to be passive, before a mating is attempted? The theory could in fact be correct, as I have witnessed both the Sapphire and the Emerald attempt a mating with a hummer which has been at re

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SOME NOTES ON THE BREEDING OF CRANES AT THE COTSWOLD WILD LIFE PARK

By BRIAN C. SINFIELD (Director of the Cotswold Wild Life Park,
Burford, Oxfordshire, England)

Four species of cranes, Sarus, Black-necked Crowned, Demoiselle, and Lilford are kept at the Park. The oldest residents have been here only $2\frac{1}{2}$ years. It was therefore quite exciting when two of our group of eight Demoiselles paired up. I estimated their ages to be about three years as they came to us very young. On April 21st this year an egg was laid in a wooded clearing in a corner of their enclosure, about 30 yards from the public path. The enclosure itself contains a group of both Demoiselle and Crowned cranes and measures about $1\frac{1}{2}$ acres in extent. Part of it is wooded, part open. Apart from the fact that all the birds are caged, they live virtually natural lives.

Both birds became extremely aggressive, attacking everything that came within their twenty yard territory. They would flatten themselves against the ground, wings spread out and forward, and attack in this manner. Occasionally they would launch into their "dance", a display of leaping about throwing twigs and pieces of turf in the air and stabbing the earth with their sharp beaks. Often this preceded their more aggressive manoeuvres. The second egg was laid almost two days later. They were greyish-brown in colour and slightly blotched. The first chick hatched on 19th May the second on the 21st. The incubation period was therefore 29 days. The chicks appeared to be no more than 5 in. in height. You could just see their little yellow heads above the grass as they stumbled after their parents. On 21st May we noticed one of the chicks sitting on its own with the parents several yards away. We decided to leave it alone for half an hour in the hope that Mum and Dad would not desert it, but when we returned half an hour later there was no sign of the baby. It was eventually discovered some yards away having been killed and half eaten by a squirrel. The remaining chick was still well under the protective wing of its parents but on 24th May this chick was noticeably absent, and was never found. Although all of this was very disappointing we knew at least that we had a good breeding pair. I think that probably both the babies were initially weakened by the wet cold weather that followed some days after they were hatched. Also the grass was rather long and continually wet.

In late June the Sarus cranes which share a paddock with Llama and Guinea showed signs that they were going to nest. In their case a definite shallow nest of bits of twig, feathers and dried grass was fashioned a foot away from their pool in exactly the same spot as the year before. At that time they laid two eggs, later found to be infertile.

We waited expectantly and then on 26th June the first egg was laid and two days later a second. It is interesting here to note that during the incubation period the previous year the hen bird turned savagely on the cock. In fact she chased him over the fence no less than three times. We were therefore forced to remove him for the duration. The hen then sat the incubation out on her own. We expected the same thing to happen this year, but instead they both behaved perfectly, swapping the incubation between them.

Since the weather was rather unsettled we decided to remove one egg after about two weeks, and place it in an incubator. The remaining egg duly hatched 29 days later, the one in the incubator never did. The chick was about seven or eight inches in height and pale buff in colour. The parents now spent most of the day grubbing about for worms and insects. We decided to supplement their normal feed of mixed grain and chopped veg. and day old chicks with maggots and mealworms. They were often seen feeding the baby with insects and worms, probably to with some regurgitated matter, but we could not get close enough to see.

As usual following the birth of cranes in this country, we had some very cold wet weather. This was about a week after hatching. The chick stayed wet for some days and I had fears that the chick would not survive. However I decided to leave it with the parents. The grass in the paddock had been cropped short by the Llamas, which meant that the chick was not wading through wet grass as was the case with the Demoiselle. The chick did not appear to have suffered any ill effects from the wetting at all, and was soon grubbing about in the earth alongside its parents. At about the second week we sprinkled worming powder on the food, in the hope that the chick would manage to get some. If one tried to approach the baby the parents set up an awful din and attacked savagely. At the time of writing (30th August) the chick is a little over two months old and about 18 in. in height.

So far neither the Lilford nor the Crowned Cranes have shown any sign of breeding.

We discovered an interesting phenomenon in our Crowned Crane following the death of one of them. In this bird an exceptionally long beak growth was found and the lower mandible had broken off leaving the poor bird no way in which it could feed. While this in itself in an old bird is not extraordinary, indeed it is quite commonplace in toucans and hornbills, we were rather surprised when rounding up all the others and discovered that every bird (Crowned Cranes) had an overgrown beak. Both mandibles in some of them were over six inches long.

I can only assume that the ground must be too soft for them, although if this were the case surely the other three species would have shown similar deformity? I have kept cranes for many years on similar ground and never had this kind of trouble before. The mandibles were damaged

trimmed down and several additional birds placed in with the others. It will be interesting to see if their beaks are affected also.

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NEWS AND VIEWS

Among the pheasants hatched at the Pheasant Trust early in the season were nine Edwards', five Satyr Tragopans and 30 Common Koklass.

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At Daws Hall Wildfowl Farm, Major Iain Grahame has succeeded in rearing Blood Pheasants for the second year in succession. In addition he has chicks from Scintillating Copper, Chiquis Peacock, Koklass, Crown-eared and Siamese Fireback Pheasants.

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The Amsterdam Zoo has repeated Frankfurt's success in breeding the White-necked Bald Crow (*Picathartes gymnocephalus*). After years of failure, during which the ten chicks hatched have been lost, four youngsters have been reared to independence.

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Part of the great Conservatory at Syon Park, Brentford, Middlesex, well known for its magnificent display of exotic plants, now has an additional attraction and houses Tanagers and Hummingbirds of several different species.

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Four Black Grouse chicks hatched from eggs found deserted in the Scottish Highlands have been deposited at Graham Dangerfield's wild-life centre at St. Albans.

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Two young Ospreys have been hatched from three eggs in the eyrie Loch Garten, Inverness-shire. Since Ospreys returned to Loch Garten in 1959, after being absent from Britain for about 50 years, 25 young have been successfully reared at the eyrie. Despite the robbery of all three eggs from the nest, five pairs of Ospreys reared 11 young at other eyries making 1971 the best year so far.

* * *

A. J. Mobbs writes: "Housed in one of the small indoor flights at the Botanical Gardens, Edgbaston, Birmingham are two birds which to say the least are very strange companions. They are a Senegal Parrot and a Speckled Mousebird. The parrot is in excellent condition and the mousebird appears to be extremely healthy. Featherwise, however it leaves much to be desired. This is most probably due to the habit this species has of spending much of its time hanging from the wire netting. We have not had the opportunity to observe these strange companions for

any length of time. I have noticed, however, that the mousebird seems a little wary of its companion, although both birds sit close together on occasions. I have also seen the parrot attempting to feed the mousebird with regurgitated food."

* * *

Although Bluewinged Grass Parrakeets are generally reliable breeders in captivity, they usually produce small broods and are not often double brooded. The breeding activities of one of my pairs is, therefore, worth recording. The cock was hatched in 1965 and the hen in 1966. The breeding record is as follows:-

	First nest	Second nest
1967	6 eggs all infertile	6 chicks reared
1968	6 chicks reared	6 " "
1969	6 " "	6 " "
1970	6 " "	6 " "
1971	6 " "	3 " "
1972	5 " "	did not nest again.

All of these youngsters have developed into excellent specimens. Many of those which I have retained have bred successfully but not nearly so prolifically as their parents. The pair show no signs of growing old although this year is the first in which they have produced only one clutch of eggs.

* * *

Several Iris Lorikeets (*Psitteuteles iris*) have recently been imported into Great Britain. I have not seen any of the specimens which have been offered for sale but those in the San Diego Zoo, which I visited in June, were most attractive. It is smaller and slimmer than a Lovebird, mainly green with striking red, yellow and blue areas on the head. It has been bred in the San Diego Zoo and the parents and their offspring were in view at the time of my visit. I hope that the opportunity to establish this desirable species as an aviary strain will not be wasted.

J. R. H.

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REVIEWS

DUETTING AND ANTIPHONAL SONG IN BIRDS ITS EXTENT AND SIGNIFICANCE. By W. H. THORPE in collaboration with J. HALL CRAGGS, B. and T. HOOKER and R. HUTCHINSON. Leiden.: E. J. Brill, 1972. Price 96 Dutch guilders.

The phenomenon of duetting—either simultaneous or alternating song—between the mated male and female is known to occur in 32 or more families involving approximately 120 species of which nearly 100 are tropical. There are some nine families in which this reaches its highest development, with alternating or precise union song between the paired male and female, used even when the birds cannot see each other. The result of this is that distance, intervening vegetation, etc., offer little or no obstacle to mutual recognition and the maintenance of contact. The nine families are: Megapodidae, Phasianidae, Rallidae, Formicariidae, Troglodytidae, Turdidae, Sylviidae, Laniidae, and Meliphagidae.

The author has studied the phenomenon in certain of these families starting with the Laniidae, with special reference to the species of *Laniarius* and their geographical distribution and ethological and ecological isolation. Records of musical examples were taken in the wild in various localities and then analysed, giving the number of notes, duration, semitones, Herz frequency, and remarks on the duets, which sometimes include a third bird duplicating note 1 or notes 1-3. The results are given in tabular form the first table concerning *Laniarius aethiopicus major* of the Nakuru-Dundori population with 102 records; a second table of 10 records of the same species in Uganda; a third with 24 examples of the Itale-Kaibos-Kapenguria population; and further tables dealing with three species or subspecies of *Laniarius*. Musical examples are then given of duet patterns of various species of *Laniarius* followed by a detailed discussion of the seven races of *L. aethiopicus*, the Tropical Boubou and the Boubou-like.

Sketch maps are given showing areas where continuous tape recordings were taken to show the interchange between territories, without any pair trespassing on another's home ground. Where the country is suitable and birds are in fair numbers these territories tend to be rounded or oval and average about seven acres in extent. Cases of trio and quartet singing may occur at territorial boundaries—as a result of aggressive encounters between mated pairs.

Experimental studies were then carried out on *Laniarius aethiopicus*, some hand reared and others wild caught, maintained in tropical aviaries. The results confirmed field observations that the birds have exact control of the timing, pitch, and overall rate at which they produce their duets. The pitch control was found to be accurate to a semitone and even insistent to a quartertone. The aviary work confirmed the view that

one of the major functions of the imitative ability of the birds was to establish and strengthen social bonds.

Succeeding chapters deal with other species of *Laniarius* and musical aspects of the vocalizations of *L. aethiopicus* and *L. ferrugineus*. Finally the behaviour of Robin Chats and Grass Warblers is also considered.

This comprehensive and detailed account of one of the more interesting aspects of bird behaviour summarizes the available information on the subject in addition to providing a wealth of material for future studies. It is likely long to remain the standard work on the subject.

E. H.

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MONOGRAPHIE DER GATTUNG *ERYTHRURA* SWAINSON
1837 (*Aves, Passeres, Estrildidae*). By VINZENZ ZISWILLER, HAN
R. GUTTINGER and HEINRICH BREGULLA. Bonner Zoologische Mono
graphien, No. 2, 1972. Price 35 DM.

A most interesting and comprehensive monograph on the parrot finches, based on detailed studies of their taxonomy, anatomy, and behaviour both in the wild and in captivity. A "must" for any serious aviculturist who is interested in these birds and who can read German. Among the very numerous illustrations are several photos of the natural habitats of these birds, or perhaps one should sometimes say "un-natural" as many of them show man-altered areas, to which some species of parrot finches have successfully adapted. There is also a coloured plate showing all species, either "full figure" or in some cases "head and neck" only and a colour photograph of Royal Parrot Finches feeding in a fig tree. A great deal of information as to the foods taken by parrot finches, both in the wild and in captivity are given.

To pick out just a few currants to indicate how much there is of interest in this very rich cake:

Little is recorded of the behaviour of the Pintailed Nonpareil, *Erythrura prasina* in the wild, in spite of its being so extensively collected and captured. (P. 27). Fruit doves of the genus *Ptilinopus* appear to be serious food competitors with those parrot finches, such as the Royal Parrot Finch, that specialise in feeding on the seeds of wild figs, driving them persistently away from fruiting trees. (pp. 68 and 72). As in Britain, so in such exotic islands as Viti Levu, the native trees are being deliberately destroyed in order to plant exotic conifers (P. 73). The Red-headed Parrot Finch breeds well at first in captivity but after a few generations the fertility rate soon declines. The reason for this is not known (P. 121). This species is, fortunately, still common and widespread in New Caledonia where it adapts well to man's alteration of the environment. It is considered possible however, that the [past and continuing

introduction of exotic species—The Chestnut-breasted Munia and Common Waxbill are already well established and the (Red?) Squirrel is recently been introduced—might ultimately endanger it (P. 52). The Royal Parrot Finch is threatened by the introduction of bird malaria and its carrier, the mosquito *Culex pipiens* (P. 69).

On a lighter note; Hell may have no fury like a woman scorned, but the male parrot finches of the Melanesian islands show a comparable reaction to that of their human counterparts in this situation (P. 125).

The Gouldian Finch is not included in *Erythrura* but in the monotypic genus *Chloebeia*; it appears to have as much in common with the munias, *Chondestes*, as with the parrot finches.

D. G.

* * *

BIRD-KEEPING AND BIRDCAGES: A HISTORY. By SONIA ROBERTS. Newton Abbot, Devon: David & Charles 1972. Price £2.95.

Birds have been kept by man since the dawn of civilisation, first as assistants in hunting and the control of vermin and subsequently as pets. In many cultures, apart from sacred-birds kept in temples, trained or tamed birds were maintained in royal menageries even before birds were kept for food. The author describes the aesthetics and mechanics of birdcage and aviary design ranging from at least one knowledgeable aviculturist in Noah to the Snowdon aviary in the London Zoo.

The first chapter in this splendidly illustrated history deals with ancient times when birds of curiosity and interest were kept in many civilisations including the ancient Egyptians, Chinese and the Greek and Roman empires. An example of a birdcage in Byzantine tiles very closely resembles a modern parrot cage and aviaries were a common feature in Roman villas.

The second chapter deals with Renaissance exoticism and after, which created an ideal climate for the spread of aviculture. The domes which embellished homes and mosques were reproduced in Moorish ball-topped birdcages, creating a pattern which exists to this day. The opening up of new trade routes and the discovery of new countries added to the influx of exotic species of birds that rich aviary owners wished to acquire and resulted in the development of more elaborate aviaries many of which are illustrated. Then came the age of elegance with bird keeping on a grand scale developed with the changing fashions in landscape gardening in the nineteenth century and many examples are described and figured.

The rise of the fancy dates from the middle of the eighteenth century, especially the beginning of the nineteenth, and when the London Bird Show opened in 1828 birds were already an important feature and people were prepared to pay handsomely to see a bird show. Elaborate birdcages

and aviaries were designed ranging from Chippendale style and porcelain cages to elaborate aviaries. The boom in budgerigars and the development of pleasure gardens and zoos in recent times have all contributed to a great variety in the designs of cages. Since World War II a cage collecting craze has developed and illustrations are given of some of the more grotesque examples and current prices.

This attractive book concludes with a county-by-county guide to establishments in the British Isles of interest to bird-lovers.

E.H.

* * *

BIRD STUDY. By ANDREW J. BERGER. London: Constable & Co. 1972. Price £2.

This is a reprint, in a practical form, of a work first published in 1961. Dr. Berger is an excellent teacher of ornithology, now at the University of Hawaii, and this book is a general treatment of all aspects of bird knowledge written for students, but it also constitutes a useful guide for all bird lovers.

Eleven chapters deal with the introduction of the bird, field identification, bird habits, migration, behaviour, song, courtship and nest-building, eggs and young, structure and function, conservation and systematics. All is well treated and accurate, if naturally rather condensed. The section on systematics particularly is a little incomplete, though generally sound.

J. D.

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NOTES

BREEDING OF THE BLACK REDSTART (*PHOENICURUS OCHRURUS* L.) IN GERMANY

In July 1972 Mr. O. Bielefeldt, Lübeck, an aviculturist who specialises in keeping European birds (which is permitted to some extent in Germany) told me that Black Redstarts (*Phoenicurus ochrurus* L.) had just successfully reared two youngsters.

The Redstarts shared a densely planted aviary (ca. 4 × 2 × 2.5 m.) with a Nuthatch (*Sitta europea*), two Wheatears (*Oenanthe oenanthe*), a pair of White Wagtails (*Motacilla alba alba*), which had also been making attempts to breed this year, and a pair of Quail (*Coturnix coturnix*). The nest was built in a wooden nest-box which was half open in front. The diet was a soft-billed bird-food, consisting of egg, a sort of Madeira cake, carrots and dried insects together with plenty of mealworms. Unfortunately Mr. Bielefeldt could not observe the process of breeding and rearing and did not make any notes.

Black Redstarts are not often kept in Germany and very infrequently bred; the last account of successful rearing being written by P. Ganzlin before World War II and published in *Die Gefiederte Welt*, 1937.

KLAUS-GEORG MAURER

FURTHER NOTES ON THE BILL COLOUR OF THE WHITE-BELLIED GO-AWAY BIRD

In the January-February issue of the Magazine, (pp. 37-38,) I commented on the likelihood of the bill colour of the White-bellied Go-away Bird, *Corythaixiodes cogaster*, providing a means of sexing this species. My comment was prompted by the capture of two pairs who had mated-up in the wild, for in both instances one of the pair possessed a dark, virtually black bill and the other a greenish-yellow bill.

Recently I visited the National Museum, Nairobi, where I was able to examine specimens of this species. Of the skins in this collection, eleven with black bills were labelled as being male, while two were labelled female. On the other hand, three with greenish-yellow bills were shown as being female, and one as being a male. One skin had no sex indicated on its label. Perhaps the most interesting of all was a specimen with the plumage wholly snowy-white; this was labelled as being a male and the bill was described as being pink, tinged green.

Lack of time prevented me from taking measurements and noting the locality where individual specimens were collected to investigate whether either are relevant to the issue. Thus my theory still remains inconclusive.

Incidentally, half-a-dozen live nestlings of this species that I have been able to examine have all possessed black bills.

MALCOLM ELLIS.

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CORRESPONDENCE

INTER-SPECIFIC PREENING OF CUTTHROAT AND MALABAR STARLING WITH QUAIL

I was interested in Mr. Trollope's note on interactions of other species with mated Quail (*Avicult. Mag.* 74/ 11) since I have noted on numerous occasions a cock Cutthroat, *Amadina fasciata*, preening a hen Japanese Quail, *Coturnix japonica*. I would mention that the Cutthroat did not have a mate, and that the Japanese Quail consisted of three hens and a cock. The preening was not mutual, but at times the Cutthroat clumped with two or more of the hens. At other times it displayed to the hen quail, and also tried what looked rather like an attempt to mate with it, being taken for short rides around the aviary on the back of the quail. I have also observed a cock Malabar Starling, *Sturnus malabaricus*, preen and clump with a Japanese Quail. The starling also lowered its head to solicit preening, but this was not returned. The starling was at this time a solitary bird, but although since then I have obtained a mate for it the pair has been moved to another aviary, and I have not been able to observe if preening took place again.

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Blackshot Road,
Weybridge, Surrey.

Both Mr. Lambert's observations given above, and those of Mr. Ellis (*Avicult. Mag.* 78/ 38) on a similar association between a Negro Finch, *Nigrita canicapilla*, and a Green Pigeon, *Treron australis*, refer to the smaller bird resting on the back of the larger one. During earlier studies by Desmond Morris of Java Sparrows, *Padda oryzivora*, roosting with Barbary Doves, *Streptopelia roseogrisea*, he found the smaller bird often moved from side to side over the back of the larger one. He considered that the smaller bird regarded the much larger one as the equivalent of a clumping and resting group of its own species. In such a group lined up on a perch the outside birds will from time to time run along the backs of the others and squeeze down in a gap in the middle of the group. Morris suggested that the smaller bird on the back of the large one was looking for a non-existent "middle" on the back into which it could descend. (*Assistant Editor*).

REQUEST FOR INFORMATION ON FIRST BREEDINGS

When a list of records of first breedings was being compiled it became apparent that in some instances (usually when the author had not mentioned the possibility of this fact) accounts published in the magazine may have been first breedings, properly recorded under the Society's rules, but not duly recognised in the usual manner.

In order to rectify this situation any member or reader knowing first breedings of the following species prior to the dates given below is requested to communicate at once with the Honorary Secretary.

RING OUSEL, *Turdus torquatus*; prior to 1938.

PURPLE-HEADED STARLING, *Lamprotornis purpureiceps*; prior to 1969, other than that noted by Hopkinson.

FIELDFARE, *Turdus pilaris*; prior to 1969.

MISTLE THRUSH, *Turdus viscivorus*; prior to 1969.

STARLING, *Sturnus vulgaris*; prior to 1969.

CONFERENCE

ON

TROPICAL HOUSE BIRDS

To be held at the
COTSWOLD WILD LIFE PARK,
BRADWELL GROVE,
near Burford, Oxfordshire, on Friday, 3rd November 1972
10.0 a.m. - 5.30 p.m.

CHAIRMAN: M. JEAN DELACOUR

Subjects covered will include:

STARTING A SMALL TROPICAL HOUSE
FIXING SPECIES
THE MANAGEMENT OF NECTAR-FEEDERS
BREEDING RESULTS IN CHESTER ZOO'S TROPICAL HOUSE
DESIGN AND ENVIRONMENT

The Conference will be open to all British zoos and bird gardens,
and members of the Avicultural Society.

Registration fee, payable to the Cotswold Wild Life Park, £3.00 per
person, including luncheon and refreshments, should reach the
Secretary, Cotswold Wild Life Park, Bradwell Grove, Nr. Burford,
Oxon, by Friday, 27th October.



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NEW MEMBERS

The 15 Candidates for Membership in the July/August 1972 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

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MAKINS, W. M., Pensthorpe Hall, Fakenham, Norfolk. Proposed by W. Perowne.
POSTEMA, J. J., Veenakkers 4, Gieterveen, Holland.
RICHARDS, DR. P. R., Dean Cottage, Cookham Dean, Berks. Proposed by Mr. B. Field.
RINGLE, D. A., 6539 Sagamore Road, Shawnee Mission, Kansas 66208, U.S.A.
SMITH, C. D. R., 16 Renner Street, Alice Springs NT5750, Australia.
VOLKEMER, GERD, 637 Oberursel Koehlerweg 22, West Germany. Proposed by Mr. Steinbacher.

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MR. D. F. CASTLE, to Fairwinds, The Street, Mortimer, Reading, Berks. RG7 35Y.
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MR. H. A. MOGG, to North Bridge Villas 2, Magdalers Road, Ripon, Yorks.
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THE AVICULTURAL SOCIETY

Founded 1894

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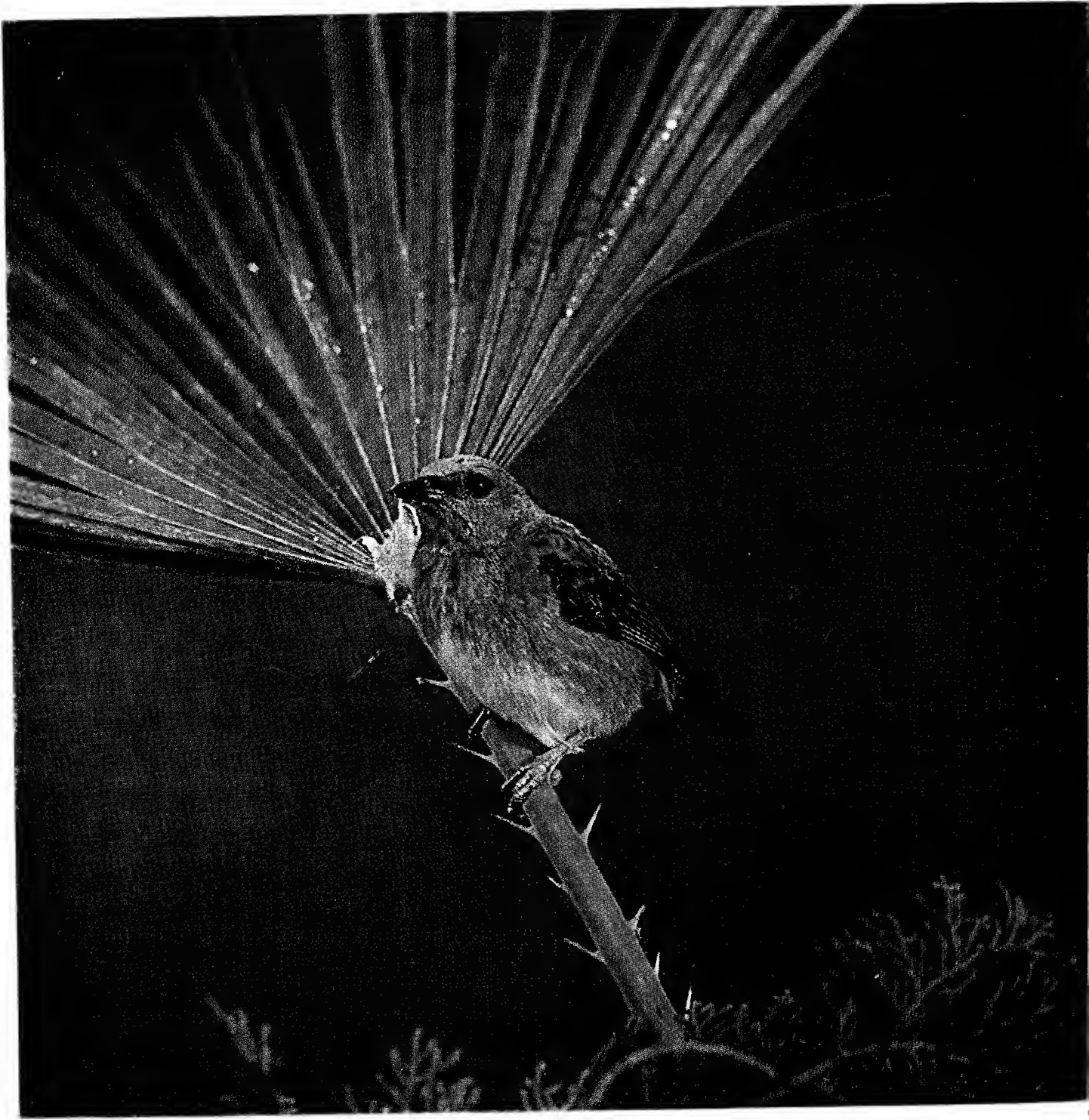
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[*San Diego Z*

Hybrid Sugar Bird × Tanager

AVICULTURAL MAGAZINE

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NOVEMBER–DECEMBER 1972

HYBRIDS SUGAR-BIRD X TANAGER

(*Cyanerpes cyaneus* × *Tangara nigrocincta franciscae*)

By JEAN DELACOUR (Clères, France)

As a complement to my previous note (AVICULTURAL MAGAZINE, 1972, 48), Mr. Kenton C. Lint, Curator of Birds at the San Diego Zoo, writes as follows:

"The parent birds nested in a hanging redwood basket 12 inches square containing a fuchsia plant. A small open cup nest was constructed by the Masked Tanager. Materials used in the nest consisted of dog hair, sheep wool and pieces of white, yellow and red yarn placed in the aviary nest building. The completed nest measured 100 mm. across the top and was about 70 mm. deep, the central depression being quite deep, sufficient for the female to be completely concealed except for her head. The clutch consisted of two eggs, white in colour with brown splotches, typical Tanager eggs.

Incubation did not start until the second egg was laid. An incubation period of 13–14 days was recorded for the two chicks. The first chick hatched 13th June 1970, the second chick hatched 14th June 1970. At 10 days of age the eyes were open and the chicks were fed regularly by both parent birds. We observed the parents feeding only insectivorous food to the chicks for the first seven days after hatching. Mealworms and *Drosophila* were fed exclusively to the chicks at this early age. When 10 days old both parent birds were seen to collect other food at the regular softfood container in the aviary and carry this food to the nestlings. The regular softfood stainless steel pans in the aviary contain bread and raisins (soaked overnight in water), diced apples, bananas, oranges, blueberries, hard-boiled egg yolks and boiled rice sweetened with Karo syrup. Diced grapes are also fed in season to the Tanagers.

"The two chicks grew nicely and left their nest at 20 days of age. The parent birds followed the chicks wherever they perched and continued to feed and guard them from other birds in the aviary. When 30 days old the chicks were observed feeding for the first time with the mother at the regular feeding pans.

"A second clutch of eggs was laid 17–18th August, also in 1970 by the same pair of birds. The two eggs hatched 20–31st August, again recording an incubation period of 13 and 14 days respectively.

"With these notes we wish to confirm Dr. Delacour's view that interspecific hybridisation may occur successfully between Coerebidae and Thraupidae which has been much disputed in the field of ornithology."

It now appears that the female Masked Tanager belongs to the subspecies *franciscæ*, not *fanny*, which is very slightly different and lives a little further north (Costa Rica).

The buffy colour on the throat of the hybrid, as well as its white belly reminds one of the female's feather pattern, whereas the pale blue crown recalls that of the male. Curiously, the black saddle of both parents is lacking.

In view of this breeding of Sugar-Bird and Tanager it should perhaps be pointed out that in the most recent arrangement of these species, in Peter's "Checklist of Birds of the World" vol. 14, (1968) edited by R. A. Paynter, the Coerebidae has disappeared. The genera *Diglossa*, *Chlorophanes*, *Iridophanes*, *Cyanerpes*, *Dacnis*, *Hemidacnis*, *Xenodacnis*, *Oreomanes* and *Euneornis* are all put with the Tanagers in the subfamily Thraupinae of the Emberizidae. The remaining genera *Coereba* and *Conirostrum* (including *Ateleodacnis*) have been placed provisionally with the American Warblers, Parulidae, although Skutch has suggested that the former is so distinct that it might be regarded as a monotypic family and the latter might be related to the typical buntings. The San Diego breeding illustrates how hybridisation can at times help to confirm suspected taxonomic relationships.

BREEDING THE BEARDED REEDLING

(Panurus biarmicus)

By M. I. BARBER (Ipswich, Suffolk, England)

The pair of Bearded Reedlings, *Panurus biarmicus*, were imported from the continent, and to persuade them to breed I gave them aviary conditions similar to their natural environment, but with some differences. The aviary was planted and designed to produce as much live food as possible. It measured 15 ft. \times 8 ft. \times 8 ft. and was constructed with no solid shelter overhead or around the sides. I feel that although such shelter has its advantages it also has a disadvantage in that birds may become upset at the disturbance of which they cannot see the cause; whereas in an aviary when all round they can become used to the presence of neighbours, my birds, and the sight of other birds overhead, and if alarmed can go to cover the plants growing in the aviary, as they would in the wild. This appeared to be the right idea, since the birds appeared to feel secure in the reed-bed and thick vegetation which I provided, and seemed completely at home in the environment I had created.

The vegetation cover took up three-quarters of the aviary flight and consisted of a pear-shaped reed-bed about 12 ft. long, 6 ft. at its widest, growing to 2-3 ft.; with a cavity 12-14 in. deep filled with mud from a marsh and planted mainly with reeds but also with meadowsweet and other marsh flowering plants, a large clump of nettles, spear-grass, and three clumps of Pampas Grass which I added to thicken the cover. It also contained a two-year-old elderberry and a large blackcurrant bush, with branches spreading into the reeds. To encourage insects I also added a large heap of horse manure, partly in the nettles and partly in the open. This was required to be kept moist. The combination of mud, water, manure, and heavy plant growth appeared to hold insects and encourage them to breed and provide live food.

Because of the vegetation the amount of room I had for movement in the flight was a short path on one side of the reed-bed and a small area just by the door where I could feed the birds. I had no need to go right into the flight and all I would do was to open the door, place food inside and close the door again; and in this way I only disturbed the birds once or twice a day.

Before describing the nesting it may be of interest to record the various types of behaviour that I witnessed with this pair, since for those who have watched these birds in the wild and do not know of their behaviour from the little information in most books such observations may help to indicate the build-up prior to nesting.

I did not know that the pair were nesting, and the first intimation I had that the pair were going to nest was on the 16th June when, as I approached

the flight, I noticed the cock looking down into the reeds. This may not sound unusual but he was so still, not moving a feather, and concentrating so much that he did not notice me moving nearer, that I thought something was wrong. He stayed frozen in this position for at least three or four minutes, and I was about to investigate when he started calling, and I have hardly ever seen a bird so excited. He started to hop up and down and call for all he was worth. I really thought something was wrong and with heart beginning to beat heavily I started forward to enter the aviary but then saw the reeds move and the hen came out.

She went up to the cock who by this time was wildly excited. First he fluffed up into a ball, then crouched low on the perch, and spread his wing and tail at the same time bowing towards the hen. He then hopped over the hen and back again. This he did three or four times. The hen was just preening herself and shaking her feathers. The cock then saw me and gave the alarm and they both took cover. From that time on I had a feeling that they might be nesting and decided to watch more closely.

For the next few days I didn't see much of the pair but on two occasions I did see the cock hopping over the hen. By the 21st June I saw more of the cock than I did of the hen, and on some days never saw either of them. The feeling that they were nesting began to grow and on the 22nd I had a morning off from work and decided to sit and watch. I did so for about one and a half hours and noticed that the pair seemed to be changing places, like a shift. On 25th June when I visited my friend Frank Mead I told him my observations and he confirmed that the cock shared incubation.

Another thing I observed was the pair preening each other. Perched together they were scratching and cleaning their plumage. The hen stretched upwards and the cock moved closer and did the same. Then both fluffed out the feathers of the head, and at almost the same moment they tilted their heads as if showing each other the sides of their faces. The cock then started to preen the side of the hen's face and she in turn did the same to him. They continued this for some five minutes. It was pleasing to see the two birds behaving in such an affectionate way towards each other.

Their general behaviour did not change for several days; and on 28th June a friend suggested that I should have a look. With the aid of a camera I parted the reeds a little where I had seen the pair going down and so enough I found their nest, which was built about three or four inches above the water level in the reeds and contained four eggs. I did not stay long for fear of disturbing the birds. For me this was the greatest thing to have happened since I started to breed birds. I would mention that the pair take turns at incubation for very short periods, so much so that at first I thought they had deserted the nest.

I notified various people of what had happened but did not look again.

Until 4th July when I noticed in the morning a piece of eggshell on the aviary floor. When I returned from work in the evening I went to feed them and saw both adults out of the reeds. I decided to go in, for since I knew where the nest was a quick look would do no harm. I kept an eye on the adults, who became a little upset as I approached the nest. I did not stay long, but saw three young and one egg.

I cannot express in words my excitement at that moment, and only those who have done the same will know how I felt. My task now was to get those young out of the nest and reared successfully. I started off by offering Wax Moth larvae; and very small mealworms about one-eighth to three-quarters of an inch long, sifted out of some cultures which I had. I took as many Wax Moth as I could spare without destroying the whole culture, and then turned to the Flour Moth larvae which were breeding plentifully in with the mealworms. Fly maggots and pupae were also given, the maggots being dusted with Vionate and Calcium Lactate. I did not see what insects were selected but only made sure that they were getting them to the nest.

The adults entered the nest by one route and left by another, entering near the nest but emerging some distance away. The droppings of the young were carried to the side of the aviary and wiped off on the vertical aviary wire.

Since I work on shifts on different days of the week this gave me the opportunity to feed the birds more often. I gave the food three times a day. I had arranged to have a week off work and during this week I fed the birds five times a day, giving the food in smaller quantities. I had noticed that each time I gave more food the birds came and carried some right to the nest, and I hoped by feeding more often to encourage them to keep feeding the young.

I continued this feeding but also offered whiteworms sprayed with a dec multi-vitamins. I also shook greenflies (*Aphis*) on to the food and found that they took these readily; and after a few days I found that they were not taking the whiteworms but only the greenflies. I got in touch with Frank Meaden the day the young hatched and asked his advice on any additional food. At his suggestion I picked out white whiteworms which had just shed their skins and were soft, and also the mealworm pupae; and later, with his help, I obtained some Wood Ant larvae which were taken readily by the birds.

By the 8th July when all seemed to be going well I took another look and found I still had three young and an unhatched egg. Although I was tempted to look every day I did not do so for fear of losing them. On 11th July when Frank Meaden came and photographed them they were well feathered; and T. Sharland, who helped me by letting me have his mealworm culture saw them on 14th. On 17th July all three left the nest, and although I had been worried about possible deformities all were perfect.

The young tended to keep to the cover of the reed-bed and remained close together. Within three or four days of leaving the nest they were already beginning to take greenflies.

In describing this breeding I should like to acknowledge the help and advice of my good friend Frank Meaden, which made it possible. I have gained a lot of useful information from him on keeping softbills and he is the first person I have met who is willing to pass on to others his knowledge and experiences in this field of aviculture.

* * *

BREEDING MEYER'S PARROT

(*Poicephalus meyeri*)

By RAYMOND FRANKLIN (Chesham, Bucks., England)

Meyer's Parrot needs very little description, for recently Dr. Hawkins of California has given us comprehensive details of the races, habitats, etc. of this interesting little species of the genus *Poicephalus*.

I acquired a pair from a Harrow dealer in July 1970. I consider them to be a true pair mainly because the cock has a larger beak and more yellow on the crown; and is also a much bolder bird, if bold is the right word, as both birds were, and are, very nervous. I decided to winter them out in a flight 4 m. \times 1 m. \times 2 m. with a small shelter shed attached to which incidentally they never use except for feeding in.

They were fed the usual diet of sunflower seed, etc., supplemented with apple and carrot of which they seem very fond. To this was added a sprinkling of a multi-vitamin additive. They came through the winter very well and did not seem to bother much about the cold.

On 3rd April I hung a small log—a section of a natural hollow of an old tree with a woodpecker's hole just the right size. They showed no interest in mating except that on a few occasions the cock was seen to feed the hen on regurgitated food. Briefly that was all that happened in 1971.

They were wintered out again—a fairly reasonable winter anyway, the main problem, of course, being the possibility of frost-bitten feet as they would insist on roosting out all the time. So I fixed a sheet of glass over the top of their favourite perch. Glass may be rather cold but it does help to keep off the worst of the snow and rain.

At the beginning of January 1972 they seemed to become rather more voluble than usual so I took the old log down and partly filled it with peat. This was a bit early in the year and I hoped (?) that they would not go to nest in the worst part of the winter even though some parrots, particularly Ringnecks (*Psittacula krameri*). The hen promptly then

the peat out after a few days. The weather was wet for most of the month with snow showers on the 30th. I left the log up and put more peat in a few weeks later, around the beginning of March. This was thrown out again. On the 25th March I filled the log with rotten wood. They also objected to that! (I was beginning to think they might like some hay and feathers instead!) On the 1st April I put another larger natural log hung up at an angle as this has been known to have the desired effect. This was so not appreciated so I removed it on the 20th April. On the 25th April the cock was seen popping in and out of the original log which had been refilled with rotten wood. The week ending 14th May had been very wet and cold so I decided to have a look to see if anything was happening and on the 16th May I was surprised to see one egg so, as the birds are very nervous, I kept away.

On the 16th June, as the weather was warming up, I took another look at the log and saw two babies possibly about a week old. There was just a bit of down on them then. All this time the hen seemed to do all the sitting, while the cock agitatedly hopped about by the pop hole. On the 30th July one young was seen to peep out of the log. This must have gone on for a long time as he did not come out until the 10th August. It was a very fine bird, nearly as big as the adult cock bird, but having a shorter tail and no yellow on the crown. It was not quite as nervous as the parents. I was pleasantly surprised to see two more come out of the log on the 13th August and still one more on the 15th! Presumably these eggs were laid over a period of a few days.

From the 15th to 20th August all four babies went back into the log. I would have thought this behaviour was a bit strange but presumably Mother knows best! Now I have four fine young, rather nervous, but I hope that they will tame down, although the parents have never really come tame in the two years I have had them.

* * *

BREEDING THE BLUE-STREAKED LORY

(Eos reticulata)

By R. W. PHIPPS (Maidenhead, Berkshire, England)

I have for some years now found lories and lorikeets to be among the most engaging of birds, and was glad to have a chance of obtaining a pair of Blue-streaked Lories from some imported by Mr. Jim Hayward of Carterton Breeding Aviaries in 1971. He had six or so of these birds all in excellent condition and by then acclimatised; and although they all looked very similar Mr. Hayward selected two which he believed to be a true pair, the black belly markings of the supposed female being rather larger and rounder than those of the male.

These lories, from the Tenimber Islands between Australia and New Guinea, are a bright if rather deep crimson colour, freely marked with black on wings and tail and with dark red and black mottling on the breast and underparts. The bill is orange and narrow light blue feather extend in a broad streak from behind each eye down the sides of the neck, with similar colour on the mantle. Knowing which is which of my pair I can see a slight difference in head-shape between them, that of the male being somewhat larger and with a rather more prominent forehead. Apart from the belly markings mentioned, which are possibly diagnostic as to sex, any other differences in markings appear to be so slight as to be individual rather than sexual characteristics.

The season being summer (1971) the birds were put into an outdoor aviary of about 4 ft. \times 8 ft. \times 6 ft. high, including an open-fronted shelter—modest enough proportions by any standards, but I have found that lories do not require large spaces, being rather heavy fliers and spending much time climbing, posturing with much exaggeration and performing numerous acrobatics. The perches provided were of natural fruit tree branches complete with their various off-shoots.

The main food provided then, and through the winter, was a mixture of a complete human food such as Complan or Geval and honey in equal proportions, stirred into a paste with a little water and then diluted to a milk-like consistency with more cold water. A little fresh milk was added sometimes, and eventually a mixture of sugar and honey was used in place of honey only, with the object of more nearly matching flower nectar which almost always contains more sucrose (sugar) than it does glucose and fructose, which are the principal ingredients of honey after the bees have completed their inversion process. I am not among those who believe that honey must be better than sugar for nectar feeding because it is a “natural” food, but the general question of feeding such birds is an interesting subject in itself and beyond the scope of these notes.

Maggots, mealworms, various fruits, berries and seeds were provided through the Autumn and Winter, but little enthusiasm was shown for

any of these with the exception of some dates of the type one buys in boxes around Christmas time. The birds were transferred to unheated indoor accommodation from December to February, mainly for reasons of convenience, but I believe they could as well have stayed outside with a nest-box for roosting in the shelter part of the aviary. Lories are what one might call sensible birds, quite without the distressing suicidal tendency of most parakeets I have kept to select the most exposed place on the aviary wire for roosting, particularly during the long winter nights.

The birds were returned to the aviary already described early in March 1972 and, against all the rules, a nest-box was provided in the partly enclosed section. The box was made from $\frac{3}{4}$ in. wood, about 8 in. square internally and 20 in. high with a 3 in. entry hole near the top, with a wire ladder inside. The upper two-thirds of the front was hinged for convenient inspection of the interior, and about 5 in. of mixed peat and wood-havings was placed inside. This box was fixed in a back corner, the top being 6 in. from the translucent plastic roof. Although mating was observed during that month little interest was shown in the box, except as something to climb around and for roosting on, until quite late in May when it came into considerable daytime use.

As well as the usual nectar, maggots and hempseed were provided, both of which proved more popular than when offered previously, but during the first half of June both birds seemed to be out in the aviary too much for incubation to be in progress.

On 23rd June I took the chance when both birds were in the flight to see if there was a cold egg or two in the box, and was a good deal more than surprised to see the twin grey shapes of head and body of a chick which must have hatched a few days earlier. From about that time both parents spent much more of the daytime, as well as the night of course, in the nest-box together, and much as I would have liked to follow the chick's progress more closely they generally rushed back home whenever I approached too closely or to replenish food and water.

By this time larger quantities of more solid food such as maggots and hempseed were being taken and rather less of the liquid food. Fresh fruit, greenstuff and dates were all consumed to a greater extent, and so were maggot pupae which had previously been ignored. Fruit tree twigs were stripped of bark, which appeared mostly to be eaten. Wholemeal bread crumbs and baby food were added to some of the regular nectar, and this was now accepted, having earlier been left. The birds did not, however, welcome the addition of soya flour. Fresh corn cob was appreciated when hung from the aviary roof, but was only partly ripped when placed in a dish. The area round the nest-box was sprayed with water during hot, dry weather.

From mid-July young feeding noises were heard, mostly during the evenings and on 3rd August the chick was covered with grey down and some quills showed, mainly on the wings. On 14th August some red

feathers were visible on the head and a few days later red was also seen on the back; by this time the bird was about two months old. Early in September, in addition to a general increase in red and black feathers, some light blue ones had appeared on the crown and back of the head, a colouring which is not present in the adults; and a fair growth of tail was observed.

The parents made a lot of noise and took up quite aggressive attitudes when the nest was approached, and the young bird responded by trying to make itself as small as possible in a corner of the box, but the parents did not rush back to the nest as they had done earlier.

By mid-September the young bird appeared quite fully feathered and fully grown, differing from the parents only in the blue head marking and dark grey instead of orange bill; but although by then three months old showed no signs of leaving the nest. It did in fact leave early in the morning of 25th September, just about 14 weeks from the probable date of hatching, and apart from its rather poorly co-ordinated flying and landing techniques it moved about the aviary as freely as did the parents. The first night was spent on a branch in the shelter, head turned back in typical fashion, the parents retiring to the top of the nest-box as was their habit before nesting started. The overall red colouring can by this time be seen to be duller than the adults and the dark markings on the under side are similar to those of the cock, but a less intense black.

After the young bird had left, the nest-box was examined. Although the litter was damp and compacted it was not sticky, and the bottom of the box was quite dry and clean; surprisingly so in fact as no escape hole or wire tray were provided in the base. Little if any of the wood-shavings had been chewed up; and although the litter was replaced it could just as well have been left for another brood as far as could be judged from its appearance, texture and complete lack of odour. There was no sign of egg shell or any indication that more than one egg had been laid.

During the next two weeks the parents were observed feeding the young one, and they all appeared to get on well enough for me to conclude that they could possibly spend the winter together. However, on 9th October the parents were twice seen to make what can best be described as a sort of mock attack on the young one; more, it was judged in an attempt to drive it away than to inflict injury. These "attacks" were accompanied by a good deal of noise and although quickly abandoned on my approach, it was thought best to transfer the young bird to another aviary, since it had been seen to feed itself, especially on more solid items like apple and corn-cob. On its own now, it appears especially fond of apple and one wonders if the parents provide a fairly solid food with consequent search for something of similar texture by the young during the early days of independence.

On 12th October the parents were spending some time in the nest again and renewing their interest in the cuttlefish which is always available.

I do not want them to start this long operation again before next spring, but the box will have to be left for winter roosting. No doubt this nesting inclination explains their attitude towards the young bird.

As described above, the Blue-streaked Lory, *Eos reticulata*, has been bred by R. W. Phipps. It is believed this may be a first success.

Any member of reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

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BREEDING THE TOUCAN BARBET AT WINGED WORLD.

(*Semnornis ramphastinus*)

By BRYAN S. WARD (Heysham, Lancashire, England)

The eight-inch long Toucan Barbet is found in South America, in the somewhat confined range of Western Ecuador and Columbia.

It has a black face, crown and nape with elongated feathers from the hindcrown, and white stripes from above each eye down to the back of the head. The sides of the head, neck, throat and upper breast are blue-grey, with a broad red band across the lower breast, the abdomen and sides of the body are dull yellow. The mantle being olive brown and the rump golden yellow. It has grey-black wings and tail. The eyes are red and the feet grey.

We purchased our pair of barbets towards the end of 1970. During the following year they attempted to nest, by chipping away at a rotten log in various places, and ultimately succeeded in making a suitable nesting hole about 18 in. from the floor. This attempt was thwarted when one morning we found the female with a damaged wing, hopping round on the floor and unable to fly. She has never fully recovered, and can fly only very short distances, but gets around very well by jumping from perch to perch.

After a long period of convalescence, we reintroduced her to the male and within a couple of days she had started to use the hole that they had both hollowed out previously, even though since her accident, both the male and the log had been removed to another compartment.

As with most barbets, they spent quite some time in the hole, so I am unaware of when she first started laying her eggs, and consequently of the actual incubation time. We heard sounds from the youngsters on 16th August, 1972 and as they grew older they also grew considerably more noisy, in fact they were the most noisy of any young I have ever heard. The three youngsters remained in the nest, for what seemed to be a

very long time, the first of them leaving 43 days from the initial time of hearing them. The other two left at further intervals of two days.

For the first half of the nestling period they were, as far as I know, fed mainly on mealworms, plus a small amount of our soft food mixture. Latterly, the parents were observed taking fruit, chiefly grapes, into the nesting hole, and for the last couple of weeks, mice two or three days old were given and quickly taken into the nest for the young birds.

The young are exactly the same as their parents except that they are approximately 1 in. smaller and their colouring slightly paler. Their eyes, unlike the adults are black.

As described above, the Toucan Barbet, *Semnornis ramphastinus*, has been bred at the Winged World. It is believed that this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

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THE BREEDING OF *PYRRHURA* CONURE HYBRIDS

(*P. frontalis chiripepe* × *P. melanura pacifica*)

By ROSEMARY LOW (New Barnet, Herts., England)

My aim is to keep true pairs of parrots, but a few single birds in any collection are almost inevitable. My single birds are all housed in the same aviary, one of a range of four, three of which measure 14 ft. long, 3 ft. wide and 6 ft. high. In June of this year the aviary contained a female White-crowned Pionus, an aged male Ringneck, a female Pacific Black-tailed Conure (see *AVICULTURAL MAGAZINE*, vol. 75, 128 for a full description of this bird) and a male Red-bellied Conure of the sub-species *chiripepe*. Earlier in the year and for the two previous years the latter had paired with a Pearly Conure (*P. perlata*) but the result was always eggs which contained chicks dead in the shell. A few weeks previously the hen Pearly had been removed from the aviary and provided with a mate of her own species.

The male Red-bellied then turned its attention to the Black-tailed Conure, whose mate died in January 1971. The two birds took over a nest-box which stands on the aviary floor and measures 20 in. high and 9½ in. square. I believe that the first egg was laid on 13th June but I did not inspect the nest before going away for a week a few days later. On my return there were five eggs.

The first of these probably hatched on 8th July, the incubation period of *Pyrrhuras* being 26 days. On that day, the Ringneck, the father of many chicks in his younger days, was seen sitting on the nest-box perch



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Male parent of *Pyrrhura* Conure hybrids

[R. Grantham



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Pyrrhura Conure hybrid chick. Aged 16 days

[R. Grantha



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Pyrrhura Conure hybrid chick. Aged 22 days

[R. Granth

and looking into the nest, no doubt hearing a squeaking chick. Also on that day, I had no choice but to introduce my male Purple-bellied Parrot (*Triclaria malachitacea*) into the aviary. It had previously shared the next enclosure with a male Roseate Cockatoo but on obtaining a mate for the Roseate, the Purple-bellied had to be removed. It was with some misgivings that I introduced the Purple-bellied into the aviary but no other accommodation was available. However, his presence did nothing to disrupt the harmony of the aviary.

The next day I inspected the box to find one chick covered with long white down. The nest was then inspected daily and the chicks were handled daily from an early age. On 10th July there were two chicks, a third hatched on the 12th and on the 15th there were four chicks. The remaining egg probably contained a chick dead in the shell.

The growth rate of the fourth chick was very much slower than that of the other three and I was not surprised to find it dead when it was about two weeks old. At that age the other chicks were covered with dark grey down but this one was almost naked. The eyes of the chicks opened when they were about 11 days old and the hen ceased to brood them during the day when they were about two weeks old. At four weeks they were seen to preen themselves. Two showed no distress at being handled while the third (a hen?) always struggled and even attempted to bite on some occasions.

Not an advocate of hybrid breeding, I was, nevertheless, interested to see whether the young hybrids would take after one parent or whether they would show features of both. One of the first areas to show colour was the bend of the wing which was mainly orange in the eldest and red with a few flecks of yellow in the youngest two. As they feathered, however, it became apparent that in every other aspect they resembled the male parent, the Red-bellied Conure. The bend of the wing and the under wing-coverts are scarlet in the hen and green in the cock.

As the young hybrids grew the area of colour on the bend of the wing seemed to decrease in prominence until at the time of writing (3rd September) the colour is barely perceptible in two, which have part of the small feathers at the bend of the wing orange. In the third youngster, this area is scarlet and slightly more extensive but not very prominent. In other respects they resemble the male parent except that the barring on the upper breast is less prominent and less colourful, as in young Red-bellied Conures; also, the ear-coverts are greenish rather than buff and there is only a suggestion of maroon on the abdomen. In size they are slightly larger than the hen but a little smaller than their male parent.

Young *Pyrrhura* conures often leave the nest for short periods only at first, returning immediately imagined danger threatens. The first of the hybrids probably fledged on 28th August but it was not seen to leave the nest until 31st August when it returned after a short period in the aviary. On 2nd September I removed all three young from the nest-box but two

soon returned, although they were fully developed and perfectly able to fly.

Pyrrhura Conure chicks are very easy to rear. Soaked millet sprays, one each morning and evening, and extra apple and carrot were provided during the rearing period, also sponge cake soaked in nectar to which was added a multivitamin preparation. The usual dry seeds, sunflower, canary, white millet and niger were available but were hardly touched during the rearing period. This coincided with several weeks of almost no rainfall so no wild greenfoods could be supplied.

I have a large number of references to hybrid parrot breedings but regrettably few give details of the appearance of the resulting hybrids. In Lovebirds and Australian Parrakeets the result is often an unattractive plumage pattern which shows features of both parents. I was therefore pleased to find that the *Pyrrhuras* resembled one parent. The hybrid breedings in which this has been the case include a male Festive Amazon Parrot (*Amazona festiva*) paired to a Yellow-billed Amazon (*A. collaria*), whose three young all resembled the cock and the breeding of a hen Vernal Hanging Parrot (*Loriculus vernalis*) with a Blue-crowned Hanging Parrot (*L. galgulus*) where the young took after the hen in appearance. While visiting Clifford Smith of Denholme earlier this year he pointed to what appeared to be a Yellow-fronted Amazon (*Amazona ochrocephala ochrocephala*) and, to my surprise, asked me what it was. It transpired that its parents were a Blue-fronted Amazon (*A. aestiva*) and a Yellow-front.

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BREEDING THE HAWK-HEADED PARROT

(Deroptyus accipitrinus)

By MRS. N. HOWARD (Codsall Wood, Wolverhampton, England)

My hen Hawk-headed Parrot is eight years old. She was one of my pets for several years, at a time when very few came into this country. I had almost given up hope of obtaining a cock bird. I had two more but these were also hens. Then I managed to get a young cock which is now six years old.

This year (1972) is the first in which there has been any sign of nesting. Three different types of nest-boxes, including a four-foot Grandfather clock, were put into the flight. She rejected all and finally settled in an old box that they had played about with earlier. This box is 36 in. \times 12 in. square. It was put in two years ago, close under the roof of the flight, and tilted sideways.

On 30th April two eggs were found in the nest. The cock bird was very noisy and upset, so it was decided to close this range of aviaries to the public, except at feeding times, since the hen left the nest every time she heard the male distressed. Had we not closed this range of aviaries to the public I feel sure she would have left the eggs.

The first chick hatched 28 days later. This left the nest at nine weeks. The chick was then fully feathered and almost as large as the parents. The beak of the young bird has a light grey streak down the centre, and the eyes are surrounded by a golden ring and appear to be large and dark.

While the birds were sitting and while feeding the young they were given the same food. This was a mixture of white sunflower, hemp, linseed, canary and a large amount of peanuts, in shell and also shelled. Fruit spray, not soaked, was also given and large amounts of fruit such as pears, bananas, grapes and oranges. Rose-hip syrup, and baked custard-and-butter pudding made with eggs and milk, sugar and raisins were also given.

The young bird is now four months old and appears to be a cock bird. I believe this is a first breeding, apart from that at the Chicago Zoo in 1944-55.

As described above, Mrs. N. Howard has bred the Hawk-headed Parrot, *Deroptyus accipitrinus*. It is believed this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

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ON HAND-RAISING NESTLING HUMMINGBIRD CHICKS; OBSERVATIONS ON BEHAVIOUR AND MATURATION

BEVERLY RONGREN (Education Co-ordinator, San Francisco Zoological Gardens, California, U.S.A.)

I have hand-raised several North American hummingbird chicks and maintained them through the first year; some to the threshold of adult plumage, others through the molt into the fully adult condition. There is much of interest to relate in both situations.

The "hero" of my story is a male Black-chinned hummingbird, *Archilochus alexandri*; a species native to western United States. This particular bird hatched in a garden at Bakersfield, Ca. Other immatures have been maintained simultaneously—also native Californians; *Selasphorus sasin* the Allen's hummingbird, and *Calypte anna*.

The *A. alexandri* eggs were first sighted by the resident homeowner on 25th April 1971; one hatched on 30th April 1971, the other on 2nd May 1971. Bakersfield had heavy rainstorms on the 4th, 6th and 10th of May; and the mother bird disappeared as of 14th May. The resident then began to feed, using a commercial product with 27% protein and some vitamins and minerals, which is designed as an outdoor supplement for wild birds, not as a maintenance diet. The homeowner did not contact San Francisco Zoo at this time and was unaware of more complete formulas. She did not bring the nestlings indoors, but spoonfed them in their nest in the garden from 15th through to 29th May. She believed she fed about once per hour, sometimes oftener. The elder chick began to flutter and exercise its wings on the 29th and at that point the nest was brought indoors. By 3rd June, this chick was self-feeding and flying, but the younger gaped for food for an additional 12 days and did not leave the nest for three days more thereafter. In observations on North American hummingbirds, the normal nestling stage appears to be 3-4 weeks; the male chick spent nearly six weeks in his nest. Greenwalt believes nestling stage varies with adequacy of nutrition, and this observation tends to support that view.

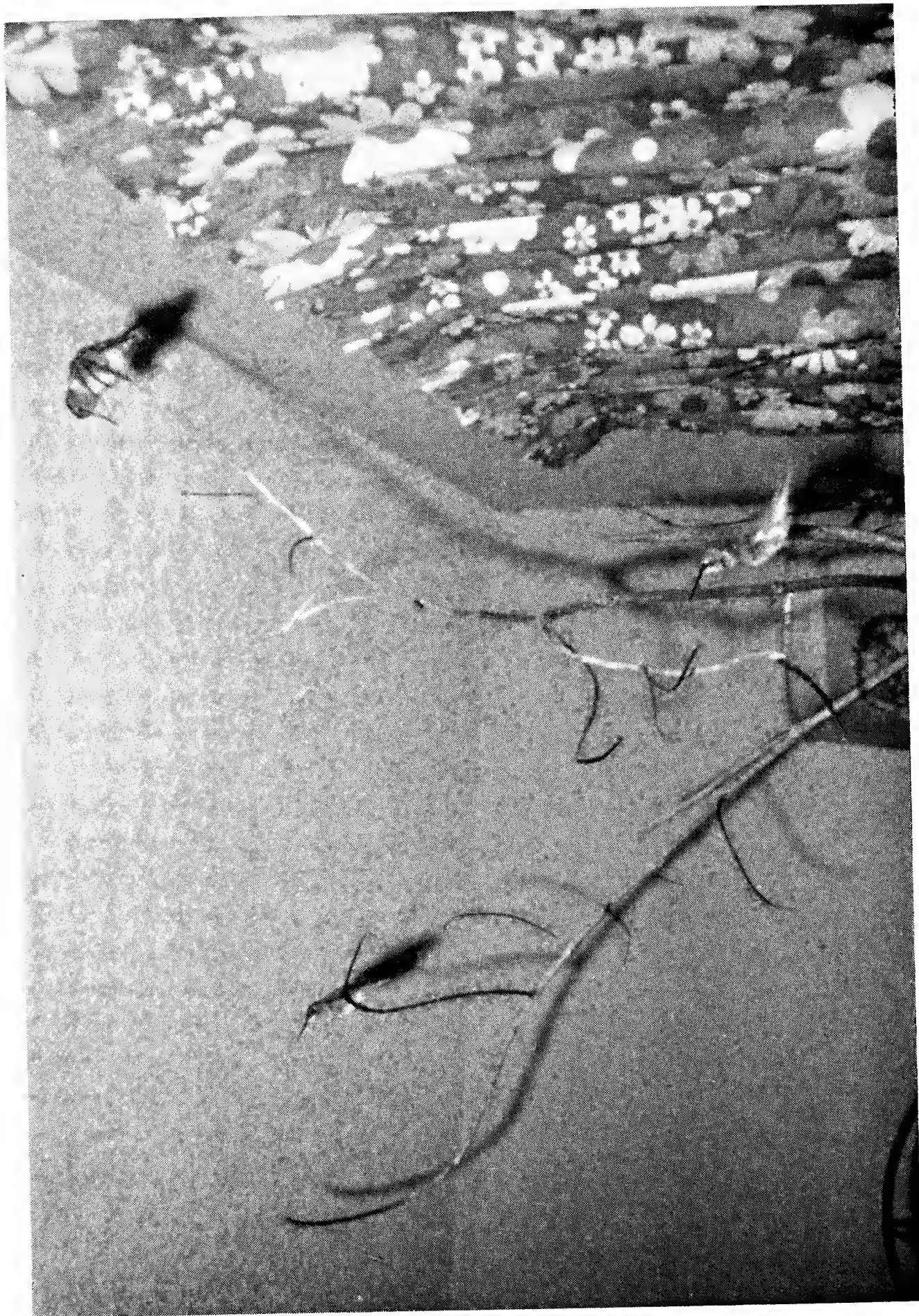
Five days after "Alex" had abandoned his nest, the resident brought both fledglings to the San Francisco Zoo; she feared they could not "make it" in the wild, and I'm certain she was right. Alex had, during his extended spoonfeeding days, become encrusted with syrupy slop. On flying and perching, he had diligently preened all offending feathers completely out; thus was bare-breasted as a go-go dancer from chin to "navel" (had he one!!). Bright pink tender, irritated flesh could also be seen across his upper shoulders and on the back of his skull. One veterinarian thought perhaps the base skin had been damaged and questioned whether feathers would ever regrow. I proceeded to feed the two



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Selasphorus sasin chick eagerly anticipates its "noon" meal (estimated age - 3 weeks)

[Beverly Rongren



on a formula with higher protein percentage, and took them home to my already thriving colony of *S. sasin* homeless chicks. Fruit flies were there available as a dietary supplement.

On 16th July ($3\frac{1}{2}$ weeks later) Alex's pink flesh began to look dotted and grainy; only a few short days later, new feathers were in place and unfurled. These were iridescent violet in colour across the neck area; the adult gorget feathers of the Black-chinned hummingbird male. Within a week, he was engaged in aerial displays typical of his species. If caged, he would demonstrate in front of the adjacent bird; a short, shallow, shuttling arc, with a loud wingsnap at each direction change. When free flying in the room, he executed the same manoeuvres, increasing or decreasing the arc length at his own whim. Simultaneously, he began to use territorial vocalizations. He was extremely aggressive for many weeks, demonstrating in front of all other birds, three poodles, and one human observer! He monopolized the air space and dominated three immature *sasin* males, except during periods of time when they were prouting an iridescent gorget feather. (I saw much evidence of hormonal linkage which *must* exist between iridescent feather growth, vocalization, and aerial display. Dominance patterns shifted throughout the fall months as one bird, then another, grew a feather.) The Allen boys did not complete their gorget feathers then; that was to occur during April-May, and took a full two months. Alex completed his first year moult ahead of the Allen chicks—during the first two weeks of March. Transformation was rapid; within the 14 day period, his pearly grey immature head feathers were replaced by the adult male black ones. His iridescent necklace did not appear to moult—having grown in out-of-phase due to the early feather loss.

Territorial vocalizations and aerial displays diminished greatly in the period December–February, although these did not disappear entirely. I believe the intense activity of September–October relates to hormonal activity in the first year male, which has been documented in other species, as for example in Rufous-sided Towhees, where the number of Leydig cells in the testes corresponds to singing behaviour and an increase in number of cells and in fall singing has been found in immature males (Davis 1958). A further interesting observation is that during the winter (and at present) the *most* dominant, aggressive bird has been the *alexandri* female.

Turning to the problem of distinguishing between females and immature males; in all the three species under my observation, behaviour and vocalization can be valuable clues. The *alexandri* nestmates proved to be male-female, though I had no absolute proof until after the Spring moult. Although Alex was identified as male during July 71, normally his violet necklace would not have been completed until spring. However, his nestmate was never observed performing a "shuttle-arc", although he does give an identical territorial call. After completing her moult,

she looks just as she did during the first year, substantiating my belief of her femininity based on behavioral observation. With *S. sasin* (four chicks from three nests raised to free flying stage); three were male as evidenced by (a) occasional sprouting of an iridescent gorget feather (orange in this species) during their first summer-fall, and (b) territorial acrobatics and vocalizations. The one *S. sasin* chick believed to be female did not display, and unlike the female *alexandri*, she did not utilize a territorial "song", only a "chip-chip-chip" warning sound. Another indicator of sex may have been the aggressive Alex's persistent attempts to court her, which unsought attentions may have hastened her death from exhaustion at six months of age.

How does one distinguish between female or immature *A. alexandri* and *Calypte anna* individuals? Both are pearly-grey with slightly iridescent backs and shoulders (green). If size is not a sufficient clue (*C. anna* tends to be larger and stockier) voice is. Tonal quality and rhythm of both territorial calls and in-flight chipperings are easily distinguishable to those attuned to hummingbird voice. Similarity of territorial vocalizations point to common background and close recent relationships between these genera, while distinguishable differences in rhythm and tone are suggestive of species recognition releasers in sympatric species. *C. anna* has a sweeter, more bell like tone in its "chip-chip-chip" and the territorial challenge has a ringing, chortling quality.

Tail wagging in flight is equally pronounced in *alexandri* and *anna*, less noticeable in *sasin* which appears to have a faster wing beat and less fluttery flight style. Tail action varies with speed, however.

The "whine" when disturbed at night is common to all three species; it can be a most piteous, alarming sound—when first I picked up a bird from its perch in the dark I nearly dropped it at the sudden and unexpected heart-stopping wail. But the chick clung to my hand (in an attempt to fly in the dark) and allowed itself to be placed in a cage for safe keeping. Within a short time, each Blackchin had learned to expect my finger lightly touching its chest in the dark, and would dutifully climb aboard to be carried away to a cage perch—locked in for the hour I was at work; thus assured an ample and unchallenged food supply each day. The Allen chicks never became that tame. All my chicks when in good health would be instantly alert whenever a light was turned on. Exceptions to this were rare and explainable. One, a flightless invalid, as he began to fail, spent longer and longer periods in torpor; once a healthy chick, found in torpor when I came home at night, was found to have somehow been shorted in food supply that day—was insufficient fuel, he was conserving his energy.

At this date, I no longer cage the two remaining in my care (male and female *alexandri*)—their "aviary" consists of my bedroom-bath, with perching branches supplied in vases; sometimes fuchsias from the garden; always open-doored cages with several containers of food; fruit flies

Bathing varies on an individual basis. The female *alexandri* bathes at least once daily; the male rarely. First bathtub; my cupped hands in the sink. Later they took to using the dogs' water bowl—I hastily bought them a parakeet bathtub, which seems to suit them admirably. I have raised only one *C. anna* chick, and it did not bathe during the few weeks I kept it. Had I retained the bird longer, perhaps it would have developed the habit. The Allen's chicks varied in their use of water. Some would wash continually in a tiny food cup filled with water, others used my hands and/or the bathtub mentioned.

At present, I am wondering if the male-female *alexandri* will breed in the bedroom, or if space is sufficiently cramped that his modified aerial displays will fail to trigger her recognition and acceptance. It seems as if I shall have to wait another year, however, since these birds were separated during the crucial spring breeding months and currently appear to be disinterested in mating. Both are adamantly territorial regarding food supplies.

REFERENCES

- WIS, J. 1958. Singing behaviour and the gonad cycle of the rufous-sided towhee. *Condor*: 60: 308-336.
 RENEWALT, C. H. 1960. Hummingbirds. American Museum of Natural History, N.Y.

RECORDS OF BREEDINGS UNDER CONTROLLED CONDITIONS IN BRITAIN

PART 2

By C. J. O. HARRISON (Berkhamsted, Herts, England)

The first part of this list was published in vol. 78 (1972), Sept.-Oct. number, pp. 169-172. The abbreviations are given in the introduction part 1. As previously requested I hope that readers will bring to my attention any errors or omission.

Since our many overseas members may feel the scope of the list to be a little limited, I would explain that with the proliferation of zoos and sections, and with the increase in the variety of publications where breeding results are likely to be mentioned it is no longer possible for any person with other commitments and a limited amount of time to track of breedings on a world scale. I would suggest that members of other countries and continents might compile and maintain the breeding records for their own regions as a permanent source of reference.

I have omitted the word "first" from the title of this second part, since I am concerned only with establishing as far as possible what has or has

not been bred under controlled conditions, and I am therefore more interested in identifying what appears to be a satisfactory record of the breeding of a species rather than making a statement on what should be considered the first breeding.

WEAVERS. (*PLOCEIDAE*).

CUCKOO WEAVER, *Anomalospiza imberbis*. H. L. Sich. *A.M.* (4) 4 (1926) 193-194, 323-324. (Sich was unaware that the species was parasitic but since he only appears to have observed eggs in a nest and later the young bird emerging, in a mixed collection of two dozen birds, the record may be genuine.)

YELLOW-RUMPED BISHOP, *Euplectes capensis*. A. Ezra. *A.M.* (5) 3 (1938) 221-222.

GOLDEN BISHOP, *Euplectes afer*. Poltimore. *B.N.* 1912: 335, 338. Also W. Shore Baily. *A.M.* (4) 1 (1923): 136 (includes *P. taha*, W. Shore Baily. *B.N.* 1915: 296).

RED BISHOP, *Euplectes orix*. De Quincey. *B.N.* 1912: 201, 260, 338 (includes *P. franciscana*. London Zoo. *L.Z. Repts.* 1917).

RED-CROWNED BISHOP, *Euplectes hordaceus*. W. T. Page. *B.N.* 1921: 223-224, 1921: 228.

JACKSON'S WYDAH, *Euplectes jacksoni*. W. Shore Baily. *B.N.* 1912: 207, 212. *A.M.* (4) 1 (1923): 115.

WHITE-WINGED WYDAH, *Euplectes albonotatus*. W. E. Teschemaker. *B.N.* 1915: 261.

LONG-TAILED WYDAH, *Euplectes progne*. W. E. Teschemaker. *A.M.* (3) 1 (1909-1910): 198, 255.

MADAGASCAN FODY, *Foudia madagascariensis*. A. Ezra. *A.M.* (5) (1938): 220.

RED-BILLED WEAVER, *Quelea quelea*. Rattigan. *B.N.* 1911: 323.

MASKED WEAVER, *Ploceus velatus*. W. Shore Baily. *B.N.* 1916: 25.

LITTLE MASKED WEAVER, *Ploceus luteolus*. W. Shore Baily. *B.N.* 1913: 305, 1915: 42.

BAGLAFECT WEAVER, *Ploceus baglafect*. A. Ezra. *A.M.* (5) 1 (1938) 248-249. (*P. b. reichenowi* bred.)

BLACK-HEADED WEAVER, *Ploceus melanocephalus*. Poltimore. *B.N.* 1912: 338.

SPOTTED-BACKED WEAVER, *Ploceus cucullatus*. London Zoo. 1913. *L.Z. Repts.*

SCALY-FRONTED WEAVER, *Sporopipes squamifrons*. W. E. Teschemaker. *A.M.* (3) 4 (1912-1913): 362-366.

ROCK SPARROW, *Petronia petronia*. E. G. B. Meade-Waldo. *A.M.* (1896-1897): 28-29.

TREE SPARROW, *Passer montanus*. W. E. Teschemaker. *B.N.* 1907: 338.

GOLDEN SPARROW, *Passer luteus*. Mrs. H. Williams. *A.M.* (1904-1905): 75-77.

- CINNAMON SPARROW, *Passer cinnamomeus*. W. E. Teschemaker. *A.M.* (2) 7 (1908-1909): 205-208. *B.N.* 7 (1908): 128.
- HAPE SPARROW, *Passer melanurus*. D. Seth-Smith. *A.M.* 7 (1900-1901): 165-167, 215.
- GREY-HEADED SPARROW, *Passer griseus*. W. E. Teschemaker. *A.M.* (3) 1 (1909-1910): 238-239.
- ANGUELA SPARROW, *Passer jagoensis*. W. Shore Bailly. *B.N.* 1923: 44.

WAXBILLS. (*ESTRILDIDAE*).

- WHITE-THROAT FINCH, *Amadina fasciata*. R. Farrar. *A.M.* 3 (1896-7): 63-66.
- RED-HEADED FINCH, *Amadina erythrocephala*. W. E. Teschemaker. *A.M.* (2) 4 (1905-6): 354-357.
- ORANGE SPARROW, *Padda oryzivora*. "Frequently bred" *vide* Hopkinson, 1926: 36. Also D. Goodwin. *A.M.* 69 (1963): 54-69.
- PECTORAL FINCH, *Heteromunia pectoralis*. Mrs. H. Williams. *A.M.* (2) 4 (1905-6): 68-70.
- ORANGE FINCH, *Lonchura punctulata*. Dunleath. *B.N.* 2 (1911): 152, 8: 13. Also Gill, in Dart, *B.N.* 4: 45.
- STRIATED FINCH, *Lonchura striata*. Willford. *B.N.* 8 (1909): 228 (includes *U. s. acuticauda*. Suggitt. *B.N.* 1914).
- YELLOW-RUMPED MUNIA, *Lonchura flaviprymna*. W. E. Teschemaker. *A.M.* (2) 5 (1906-7): 113-121.
- PISTACHIO-BREASTED FINCH, *Lonchura castaneothorax*. W. E. Teschemaker. *A.M.* (2) 5 (1906-7): 121-124.
- RED-COLOURED MANNIKIN, *Lonchura malacca*. Easton Scott. *B.N.* 1912: 338, 1913: 266. (*L. m. atricapilla* bred.)
- BROWN MANNIKIN, *Lonchura fuscata*. A. Martin. *A.M.* 67 (1961): 89-90.
- MINI FINCH, *Lonchura nana*. R. Farrar. *A.M.* 2 (1895-6): 138. Also Suggitt. *B.N.* 1914: 374.
- PIE MANNIKIN, *Lonchura fringilloides*. Weiner. In Fillmer, *Waxbills, Grassfinches and Mannikins* (1897): 61. Also Smith. *B.N.* 1914: 376.
- COPPER-WINGED MANNIKIN, *Lonchura cucullata*. Suggitt. *B.N.* 3: 70.
- BLACK AND WHITE MANNIKIN, *Lonchura bicolor*. W. Teschemaker. *A.M.* (2) 7 (1908-9): 321-323. (Rufous-backed form, *L. b. nigriceps*, was bred.)
- CHERRY FINCH, *Aidemosyne modesta*. Cronkshaw. *A.M.* 2 (1895-6): 30.
- INDIAN SILVERBILL, *Euodice cantans*. R. Farrar. *A.M.* (2) 1 (1902-3): 407.
- SIAM SILVERBILL, *Euodice malabarica*. W. Teschemaker. (1895) *vide* A. G. Butler, *Foreign birds for cage and aviary*. (c. 1906) 1: 174.

- GOULDIAN FINCH, *Chloebia gouldiae*. R. Phillipps. *vide* Fillme
Waxbills, grassfinches and mannikins, 1897.
- TRICOLOURED PARROT-FINCH, *Erythrura trichroa*. W. R. Temple
B.N. 1910: 150. *A.M.* (3) 1 (1909-10): 225.
- PEALE'S PARROT FINCH, *Erythrura cyanovirens*. London Zoo. *vide*
W. Page. *B.N.* 1912: 258. Also N. Nicholson. *A.M.* 68 (1962
197-198.
- BLUE-HEADED PARROT-FINCH, *Erythrura papuana*. M. Amsler. *A.M.*
(5) 2 (1937): 364. Also E. Valentine. *A.M.* (5) 2 (1937): 326-32
- RED-HEADED PARROT-FINCH, *Erythrura psittacea*. M. Amsler. *B.N.*
1910: 267. *B.N.* 1914: 350, 354.
- LONG-TAILED GRASSFINCH, *Poephila acuticauda*. Todd. *A.M.* 3 (1890
7): 210. Also red-billed form, *P. a. hecki*. W. E. Teschemake
1913. *vide* W. Page. *B.N.* 1913: 332.
- MASKED GRASSFINCH, *Poephila personata*. Hawkins. *A.M.* 7 (1900-1
32.
- PARSONS FINCH, *Poephila cincta*. "Easily bred, often many broods
vide Hopkinson, 1926: 40.
- ZEBRA FINCH, *Poephila guttata*. R. Farrar. *A.M.* (2) 1 (1902-3): 40
- BICHENO'S FINCH, *Stictoptera bichenovii*. G. D. Glasscoe. *A.M.*
(1899-1900): 35. Also black-rumped form, *S. b. annulosa*, Mrs.
Williams. *A.M.* 8 (1901-2): 264-266.
- CRIMSON FINCH, *Neochmia phaeton*. Mathias. *B.N.* 8: 207, 22
Hetley. *B.N.* 8: 227.
- STAR FINCH, *Bathilda ruficauda*. A. E. Nicholson. *A.M.* 7 (1900-
219-223.
- PAINTED FINCH, *Emblema picta*. Willford. *B.N.* 1910: 231, 363. A
A. J. Patterson. *A.M.* (4) 13 (1935): 300-361.
- DIAMOND FINCH, *Zonaeginthus guttatus*. Page, Suggitt and othe
B.N. 1914: 374.
- SYDNEY WAXBILL, *Aegintha temporalis*. R. Phillipps. *A.M.* 8 (1901-
289-293.
- QUAIL FINCH, *Ortygospiza atricollis*. R. Philipps. *A.M.* (3) 1 (1909-1
37-47.
- RED AVADAVAT, *Amandava amandava*. R. Farrar. *A.M.* (2) 1 (1902-
407.
- GOLDBREAST, Zebra Waxbill, *Amandava subflava*. Dunleath. *B.N.*
248.
- GREEN AVADAVAT, *Amandava formosa*. W. E. Teschemaker. *A.M.*
4 (1905-6): 70-72.
- BLACK-CROWNED WAXBILL, *Estrilda nonnula*. Mrs. N. Wharton-Tig
A.M. (5) 1 (1936): 323-325.
- RED-EARED WAXBILL, *Estrilda troglodytes*. W. A. Bainbridge. *A.M.*
5 (1913-14): 83-85.

- DUFRESNE'S WAXBILL, Yellow-bellied Waxbill, *Estrilda melanotus*. E. Robinson. *A.M.* (4) 12 (1934): 249. (Black-eared form, *E. m. melanotis*, bred.)
- T. HELENA WAXBILL, *Estrilda astrild*. Reeve. *B.N.* 1910: 343.
- SAVENDER FINCH, *Estrilda caerulescens*. Miss R. Alderson. *A.M.* 7 (1900-1): 45-49.
- ORANGE-CHEEKED WAXBILL, *Estrilda melpoda*. Miss R. Alderson. *A.M.* 8 (1901-2): 65-70.
- BLUEBREAST, *Uraeginthus angolensis*. R. Phillipps. *A.M.* 7 (1908-9): 339-350.
- ORDON-BLEU, *Uraeginthus bengalus*. R. Farrar. *vide* A. G. Butler. *Foreign birds for cage and aviary* (c. 1906) 1: 159.
- BLUE-HEADED WAXBILL, *Uraeginthus cyanocephalus*. (? J. Cranna, *per* A. R. Hynd. *A.M.* 69 (1963): 40). Also D. Goodwin. *A.M.* 68 (1962): 117-128.
- ROULET-EARED WAXBILL, *Granatina granatina*. Mrs. K. Drake. *A.M.* (5) 1 (1936): 325-327.
- PURPLE GRENADIER, *Granatina ianthinogaster*. Keston Foreign Bird Farm (E. J. Boosey). *A.M.* 64 (1958): 164-166.
- BLACK-BELLIED FIREFINCH, *Lagonosticta rara*. Sir R. Cottrell. *A.M.* 68 (1962): 27-29.
- MESON'S FIREFINCH, *Lagonosticta rhodopareia*. F. Johnson. *A.M.* (4) 13 (1935): 50-51.
- NEGAL FIREFINCH, *Lagonosticta senegala*. R. Farrar. *A.M.* 4 (1898-9): 212.
- ROSEACEOUS FIREFINCH, *Lagonosticta vinacea*. Mrs. N. Wharton-Tigar. *A.M.* (4) 11 (1933): 437-439.
- ROBERT'S TWINSPOUT, *Hypargos niveiguttatus*. Mrs. K. Drake. *A.M.* (4) 13 (1945): 198-199.
- ROSEATE FINCH, *Pytilia phoenicoptera*. Willford. *B.N.* 1909: 194. Also Sir R. Cottrell. *A.M.* 66 (1960): 161-164.
- ROSEATE FINCH, *Pytilia melba*. Willard. *B.N.* 1915: 323, 261.

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NEWS FROM THE BERLIN ZOO

By PROFESSOR DR. HEINZ-GEORG KLÖS

Again we had fine breeding successes in our Flamingo colony: five European Flamingos (*Phoenicopterus ruber roseus*) and four Chilean Flamingo (*Phoenicopterus chilensis*) were hatched.

Interesting newcomers are three Crested Screamers (*Chauna chavaria*). Even zoologists took several decades to recognize these long-legged birds as relatives to ducks and geese. The native land of the Crested Screamer is South America (Colombia and Venezuela) where they live in forests rich in water. They are armed with sharp spurs at the wings (metacarpalia). During mating time they fight fiercely with these arms and by aimed wing-strokes they may even put lesser carnivora to flight. Hand-reared young quickly become tame. Since they utter loud warning calls as soon as they see an enemy (hence their English name: Screamers) they are often kept as "watch dogs" in chicken yards.

Owing to the successes in breeding and raising birds, the Berlin Zoo got on loan two White-Eared Pheasants (*Crossoptilon crossoptilon*) hatched in the Jersey Zoo (Channel Islands) which is famous for its fine breeding successes of these valuable birds. Since it seemed dangerous, in view of disease, to concentrate such a rare bird species in only one place, the owners decided to send a pair to Berlin. The Pheasants meanwhile seem to have got accustomed quite well to their spacious aviary.

In addition to the above-mentioned hatchings and new arrivals there were hatched: three Southern Red-billed Whistling Ducks (*Dendrocygna autumnalis discolor*), five Black Swans (*Cygnus atratus*), two Black-backed Radjah Shelducks (*Tadorna r. radjah*), three Andean Crested Ducks (*Lophonetta specularoides alticola*), six Tufted Ducks (*Aythya fuligula*), two Nepal Kalijs (*Gallinago l. leucomelanus*), two Blue Crowned Pigeons (*Goura cristata*).

New arrivals were: 1 Common Tern (*Sterna hirundo*), 4,4 European Goldeneyes (*Bucephala c. clangula*), 3 Andean Flamingos (*Phoenicoparrus andinus*), 4 White Spoonbills (*Platalea alba*), 2,0 Malay Great Argus (*Argusianus argus*), 2,2 Cochin Chinese Red Junglefowl (*Gallus gallus*), 2 Black Vultures (*Coragyps atratus*), 1,0 Milky Eagle Owl (*Bubo lacteus*), 2 African Wood Owls (*Ciccaba woodfordii*), 2 Black-headed Parrots (*Nandayus nenday*), 1 Sparkling Violet-ear (*Colibri coruscans*), 3 White-breasted Kingfishers (*Halcyon smyrnensis*), 1,0 Shama (*Copsychus saularis*), 20 Bramblings (*Fringilla montifringilla*), 0,1 Bullfinch (*Pyrrhuloxia pyrrhula*), 0,1 Pin-tailed Whydah (*Vidua macroura*), 1,1 Zebra Finch (*Taenopygia guttata*).

NOTES FROM LONDON ZOO

By P. J. S. OLNEY

The main breeding season of 1972 has now drawn to a close and despite the efforts of vandals and egg-stealers to thwart our aims there have been a number of notable successes. Owls, as is now usual, have been one of the most successful groups and seven species or sub-species have reared young. These include Savigny's and Kenya Eagle Owls, Abyssinian and African Spotted Eagle Owls, Snowy Owls, a West African Wood Owl and a Barn Owl. It was particularly pleasing to rear four Savigny's Eagle Owls as the parents had only been introduced to each other a few months previously. It was however saddening to have one of the almost fledged youngsters stolen when their aviary was broken into during the night.

The most exciting event was the rearing of a Blue-backed Manakin from a pair in the Tropical House. This is thought to be the first breeding in captivity in the world and a more detailed account will be published later in the AVICULTURAL MAGAZINE. It was an event not without problems for the young bird left the nest before it could properly fly and there was considerable danger of it either drowning in the moat, being trodden on or being snatched up by our ever-pressing public. Mother and child were removed to the safety of a Bird House cage and the rest of its adolescence has passed without incidence.

Other successful rearings have included Jerdon's Imperial Pigeons, White-cheeked Turaco, Bristle-crowned, Malayan Glossy and Superb Parrots, Sacred Ibis and Hawaiian Geese. The tree in which the White-cheeked Turacos of the Snowdon Aviary had previously bred in collapsed during a storm, and a wooden scaffolding was erected over which the still flourishing creeper was persuaded to grow. Fortunately the Turacos accepted this man-made edifice and nested again in amongst the creeper.

Species new to the Collection have included Red-throated Bee-eaters and James's Flamingoes. This means the Collection now has all known species of flamingo on view.

Species of especial interest which have been received into the Collection since the beginning of the year include: two Short-eared Owls from Calgary Zoo, White-fronted Bee-eaters, Red-headed Tits, a Laughing Falcon, two captive-bred Desert Eagle Owls and an Avocet. This latter bird was found injured in Cornwall in early February and it was quickly obvious that it would never again be able to fend for itself in the wild. It had sustained a compound fracture of the wing which necessitated amputation. This was carried out in the Zoo Hospital, and the patient made a remarkably quick recovery. It has now settled down well, has caused no problems with feeding and has indeed stimulated some display behaviour from the

two much older Avocets which originally came from Copenhagen Zoo

The aviaries near the Bird House, known as the Peafowl Aviaries, have been completely renovated and replanted. They now house an interesting and colourful collection including Scarlet Ibis, Roseate Spoonbills, Ross's and Knysna Turacos, Great Indian Hornbills, Kookaburras and Blue and Green Peafowl.

As management techniques improve and our knowledge of what individual species require increases, so the symptoms of old age both before and after death become more common. Often it has to be explained to the public that apparent ill-health is in fact mainly the sluggishness or senility. Though at times we feel we run a geriatric unit our general policy on euthanasia is that it is only necessary when a bird shows obvious signs of distress or pain. The following old birds have died since the last Zoo Notes were written. The length of time the bird was in the Collection is given in brackets, though for many this will be less than their real age. The last three species were hatched in the zoo and their true age are therefore known.

Palm-nut Vulture	(27)
White Pelican	(25)
Jackal Buzzard	(20)
Greenland White-fronted Goose	(20)
Sudan Brown Parrot	(18)
West African Wood Owl	(16)
Black-necked Grackle	(16)
Chestnut-eared Aracari	(16)
Knot	(13)
Turnstone	(13)
Herring Gull	(16 years 10 months)
King Penguin	(15 years 10 months)
Black-footed Penguin	(14 years 6 months)

* * *

NEWS AND VIEWS

P. Paris describes his 1972 breeding results as "very poor" but Princess of Wales, 4 King, 4 Blue Ringneck, 10 Splendid and a few Turquoise Parrakeets were reared in his aviaries. South American Crimson Finches (*Rhodospingus cruentus*) also bred successfully but he has no idea how it happened for the youngsters "just appeared". Recent additions to this collection in Cornwall include Dusky, Hawk-headed and Amboina King Parrots.

* * *

As described in her article in this number, Mrs. N. Howard has bred the Hawk-headed Parrot this year and also has young Queen of Bavaria's Conures in the nest again.

* * *

Two Casqued Hornbills have been reared successfully at "Birdworld", Barnham, Surrey. The female was sealed into her nest by the male in May and emerged with her two youngsters exactly four months later.

A pair of another species, the Giant Indian Hornbill, were not so successful at "Birdland", Bourton-on-the-Water and L. W. Hill writes, "The Giant Indian Hornbills went to nest in March again and we had great hopes but the male was so impatient that he broke open the nesting hole and entered the nesting box. He broke the egg and emerged with the unborn chick which he dropped in front of us".

* * *

Malcolm Ellis sends further news of the breeding of Ross's Turaco in a Nairobi aviary. He writes, "The article from the *East African Standard* concerning the breeding of Ross's Turaco which was quoted in the "News and Views" section of the magazine was sent by me to Colin Harrison a long ago that I cannot remember very much about it. I think, however, that I should set the record straight as to the likelihood of this presenting a first recorded successful breeding, for unfortunately, the chick died before becoming independent. When I visited the aviary this week (August 1972) the female was incubating once again. This time the aviary has been divided into two with a wire partition, with the male housed in one half and his sitting mate in the other. They have a clear view of each other but the male is prevented from interfering in the nesting activities. I believe he was responsible for the first attempt failing." Malcolm Ellis promises to send further news of the latest attempt which, if it proves successful, will not represent a first recorded breeding of Ross's Turaco, after all, because it has been bred successfully in the Cologne Zoo and the event was recorded in the AVICULTURAL MAGAZINE about two years ago.

* * *

Colin Harrison writes, "Among a great variety of information on various animals in zoos and similar collections, the annual volumes of the

International Zoo Yearbook include a number of items on birds. The current volume (1972) has accounts of the breeding of the Kiwi and the Australian Owlet-Nightjar (*Aeogotheles cristatus*) at Sydney Zoo. The latter appears to represent the first breeding of a member of this family, and with the breeding of the Tawny Frogmouth at Wassenaar some years ago and Heinroth's famous success with the Common Nightjar breeding on the dining room rug, this seems to be only the third success with species of *Caprimulgiformes*. Other articles concern the hand-rearing of Ostriches and Rheas, breeding the Golden Eagle in Topeka Zoo and Choughs at Paignton Zoo, artificial insemination of the Copper Pheasant and notes on the display and nest-building of the Sickle-billed Bird of Paradise at Chester Zoo. The previous volume (1971) has a little more space devoted to birds and includes a record of a second captive-bred generation of White Pelicans in East Berlin Zoo, notes on hand-rearing a Stanley Crane and a Macaw hybrid, the use of canthaxanthin to maintain red plumage at Bronx Zoo, North American Grouse as zoo exhibits and unilateral patagiectomy as a method of preventing flight in birds. The last is a surgical operation for larger birds, requiring skill in surgical techniques, but is said to prevent flight without removing the tip of the wing.

* * *

W. H. Collard, Director of the Natal Zoological Gardens, reports the successful breeding of 1 Orange Weaver, 1 Glossy Starling, 5 Nicobar Pigeons, 4 Melba Finches and many other common species. New arrivals include Scarlet Cock-of-the-Rocks, Quetzals, Imperial Pigeons, Marsh Harriers and a Martial Eagle, a Grass Owl and a Stanley Crane.

* * *

Two Great Kiskadees (*Pitangus sulphuratus*), sometimes called the "Sulphury Tyrant", have been reared at Padstow Bird Gardens, Cornwall from a pair bred in 1970 at "Winged World", Morecambe. Although the parents had been reared in a Tropical House they adapted well to and reared their youngsters in an outdoor planted aviary, of ground area 200 square feet and height 7 feet, constructed against two Cornish stone walls. The incubation period was 14-15 days and the chicks left the nest when they were 25-26 days old. They were reared on a diet of fruit, "insectile food", maggots, mealworms and strips of fish and raw meat to which had been added vitamins and mineral salts.

* * *

The Orange-bellied Grass Parrakeet is undoubtedly the rarest member of the genus *Neophema*. In recent years it has been observed in the wild in Tasmania and South Australia very occasionally and only a few specimens have been kept in Australian aviaries. There have been rumours from time to time of its successful breeding in captivity but none have been authenticated. One or two pairs have somehow(!) recently reached Europe and J. Postema of Gieterreen, Holland, acquired a pair. This year

They nested, hatched five chicks but were successful in rearing only one. However, this very exciting event must surely represent the first authentic record of the breeding of the Orange-bellied Parrakeet in captivity anywhere in the world. J. Postema has the avicultural equivalent of "green fingers" and, in his well-planned, perfectly maintained aviaries, numerous other species of parrakeets were raised in 1972. Among the less common species successfully reared were 25 Blue-cheeked, 9 Mealy, 3 Brown's, 20 Pennant, 6 Yellow Rosella, 6 Crimson-winged, 3 Rock Peplars, 2 Barraband, 5 Cloncurry, 4 Barnard, 8 Hooded and 14 Many-coloured Parrakeets in addition to several Turquoise, Common Rosella and Redrump Parrakeets. He is very interested in mutations and has already gone a long way towards establishing Lutino Fischer and pure Yellow Peach-faced Lovebirds as well as several different, unusually coloured Cockatiels.

* * *

Several more pairs of the very beautiful Sun Conure (*Aratinga solstitialis*) have been imported recently. The species was bred in 1971 by Dr. C. Dodson. Three chicks were raised in Florida in a small aviary 4 ft x 7 ft. 6 ft. high, on a normal parrakeet diet supplemented with a high protein meal soaked in milk and honey.

* * *

G. A. Smith writes, "Such a drab, wet year may have affected my parrot breeding results for the three pairs of Many-colours had only single chicks and some chicks from each clutch died—previously I have accepted that a chick hatched is a chick reared! Unfortunately I lost my male New Zealand Parrakeets with 'an aberrant *Eperythrozoon* infection' presumably spread by biting insects. Mr. A. Marques kindly let me have on loan a cock of the Yellow-fronted species and although the hen laid three fertile clutches the eggs were addled each time. I feed milk sop and give vitamins B₁₂ and B complex and find the cause of the 'addling' most perplexing. Still my single pair of Rock Peplars reared four fat offspring and the Ringnecks did very well. I was unable to get a replacement cock for my hen Malayan Longtailed Parrakeet and true to feminine whim she laid a clutch, infertile of course, in May and not in late September as she has done in the previous two years. Since then I have acquired a small number of acclimatized young birds and one adult cock, and they are to be put into a new, larger aviary in an attempt to colony breed in the coming year. Celestial Parrotlets, in a small cage, laid eight eggs of which four were fertile and hatched. I placed rings on the legs of two of the youngsters and the parents literally tore the legs off to remove the rings.

* * *

Black-headed Caiques, like Eclectus Parrots and Lories, seem to be persistent nesters, for once they start breeding they lay the year round.

Unfortunately the hen stops brooding when the chicks are about ten day old and the winter chicks die of exposure. In early April I was certain that they had laid again—which would have been their fourth successive clutch. The hen stayed in the box and there had been much mating and feeding. Nothing materialized, she stopped being broody and I had to wait until 10th July before she laid the fourth clutch. The chicks are now six weeks old. At three weeks the smallest chick showed no increase in weight over a three day period and so I hand-fed it on Farex and milk and it began to put on weight. After four days I discontinued and it flourishes. The growth of this chick duplicates that of the single chick raised last year but the other two older ones have progressed more rapidly and look like leaving the nest a fortnight before the youngest.

I still have four Sun Conures. Two finger-tame youngsters are still in 'baby plumage' with many green feathers on the back and wings and less orange on the chest and neck. The other 'pair' have moulted into two almost identical males! So it will be some time before I can hope to breed them for it appears that Conures take two or three years to reach maturity. As for my Hawk-headed Parrots, comparison of mine with Mrs. Howard's breeding pair convinces me that they are a pair. The male has a far more extensive patch of red in the tail and the iris is yellow in contrast to the brown of the hen. Like Blue-rumped parrots they prefer the 'stone' of Hawthorn berries to almost any other food."

* * *

Parrakeet breeders throughout Europe are familiar with the superb collection owned by Lady Baillie and kept in a magnificent range of aviaries at Leeds Castle in Kent. The fact that no description of the collection or accounts of the events taking place in it have ever been published in the AVICULTURAL MAGAZINE has always been to me a source of regret. I am pleased, therefore, that this year J. D. Money, the Agent, has given me permission to include a summary of their 1972 breeding results in "News and Views". It is as follows:

Parrakeets. Derbyan 3, Plum-headed 2, Blue Ringnecked 5, Blue x Lutino Ringnecked 4, Red-fronted New Zealand 3, Princess of Wales 5, Crimson-winged 3, King 7, Rock Peplar 15, Bauers 4, Pennant's 4, Barnard's 4, Stanley 3, Adelaide 3, Brown's 6, Mealy x Blue-cheeked 5, Pileated 5, Red-rumped 20, Splendid 2 and Elegant 3.

Lorikeets. Swainson's 7, Edward's 2, Scaley-breasted 4.

Cockatiels. Normal 13, White (Lutino or Albino) 6.

Cockatoos. Roseate 4.

* * *

At Denholme, Yorkshire, in an exposed position overlooking Ilkley Moor, C. Smith maintains what is probably the most comprehensive private collection of the larger parrots in this country. His aviaries also accommodate several species of Australian Parrakeets including Princess of Wales, Kings, Rock Peplars, Bauers, Barnards and Mealy Rosellas

the genus *Pionus* is represented by five different species—Blue-headed, Bronze-winged, White-capped, Maximilian's and Coral-billed. There is also a pair of Hawk-headed Parrots, several species of Cockatoo ranging in size from the Palm to the Roseate and including several magnificent pairs of Leadbeater's and some Amazon Parrots of which an exquisitely beautiful pair of the Vinaceous species stands out in my memory. What is particularly exciting and almost unique about the collection is the fact that almost all the birds are in pairs in large outdoor aviaries. The beneficial effects of such accommodation on their condition and image is almost unbelievable. Similar species kept in the conditions which exist in most British Zoos are dull, listless and drab by comparison. Many successful breedings occurred in 1971 and 1972, including Umbrella, Lesser Sulphur-crested, Citron-crested and Leadbeater's Cockatoos; Yellow-fronted, Double Yellow-headed and Vinaceous Amazons and African Grey Parrots. This year Blue-headed Parrots nested and produced fertile eggs which the hen incubated assiduously but the embryos died on the point of hatching.

It is more than two years since an article by C. Smith on his success in breeding the Double Yellow-headed Amazon appeared in the *AVICULTURAL MAGAZINE*. The Council of the Society has still not decided whether its Medal should be awarded for a first breeding because it cannot decide whether the Double Yellow-headed Amazon is a true species or a subspecies. It certainly looks very different from any other Amazon species and, in any case, the breeding is a particularly meritorious one. Perhaps the members of the Council would be better employed and serve the culture better if we gave more time to considering how to improve the magazine and make membership of the Society more attractive!

J. R. HODGES.

REVIEWS

BY ANIMALS. London: John Gifford Ltd., 1972. (No price given.)

This is a curious collection of photographs, the result of much searching around in the U.S.A., Europe and especially Africa, with texts by Polina Ross translated by Christina Campbell-Thomson and to make it still more international, printed in Spain.

No one can withstand the appeal of baby animals whether mammals or birds and this is just the choice for a Christmas present for children. The photographs are charming but the text is so trivial (and inaccurate) that it might well have been omitted.

E. H.

ENCYCLOPAEDIA OF AVICULTURE. Vol. 2. Edited by A. RUTGERS and K. A. NORRIS. London: Blandford Press, 1972. £8

The first volume of the English edition of this encyclopaedia was published two years ago, and covered a systematic series of bird families from the ostriches to the pigeons. The second of the three volumes is now published and continues the sequence; dealing with parrots, cuckoos, touracos, owls, nightjars, swifts and hummingbirds.

In format and content this volume is very similar to the first. It has one special feature in that, recognising the importance to many aviculturists of the parrot family, the editors have devoted nearly three-quarters of the volume to it, and have given an entry for every species. This includes a brief description of the adult male and female; subspecies are listed, and in many cases the distinctive differences are given, and in some instances distinct subspecies frequently kept in aviaries are given separate entries. In this extensive coverage of the family the volume is probably at present unique.

There is an introductory section on the keeping and feeding of parrots and additional general summaries in the text for some of the major groups such as the Amazons. The Budgerigar has a special section which includes information on colour breeding and establishing liberty flocks, and on the Fancy; and there are also several colour plates devoted to rather improbable ideals in colour and patterns of the domestic bird.

All the species entries in the book give common names in English, German, French and Dutch; a brief statement of distribution in the wild; a description; and a general text, scanty in a few instances, which includes notes on the birds' lives in the wild and information on keeping and breeding in aviaries; the last sometimes including extensive quotations from published accounts. My only reservation here is that some of the information is quoted from rather early accounts, and might not be wholly applicable at the present time.

In general the text provides a useful source of general information on these birds and the keeping of them, and it is the text that is the vital part of the book. This does not excuse the fact that the illustrations are consistently poor. The 32 black and white plates are a mixture of small photographs and very reduced reproductions of Gould's plates, inconsistently selected. The line drawings in the text often give a very poor impression of a bird's appearance and appear to be copies of the 19th-century illustrations. By cross-checking with the monochrome plates one finds that a number are bad copies of Gould originals which were done from skins with little knowledge of the live birds. Some of the 23 colour plates are by Slijper, over-simplified but fairly accurate except for badly portrayed head shapes. Others, by van den Broecke, show shaggy-plumaged and over-gaudy birds. Plates 6 and 7 with a Lear's Macaw in one style facing a Hyacinthine Macaw in the other permit an assessment of both artists. The Leadbeaters and Moluccan Cockatoos on the p

so used as a cover illustration indicate the results of using old artists' impressions as sources in preference to modern photographs of live birds. The section on hummingbirds reflects the increasing avicultural interest in this family. There is an introductory section on keeping and transport by Jean Dealcour and others on torpidity, and breeding by K. A. Norris. The family is a very large one, and the majority of genera are represented in the text by only one or two species. The touracos have eight pages and a fair amount of avicultural information for the space allowed. The owls have only a dozen pages, although much of this is devoted to information on keeping them. The text illustrations for the latter are lamentable. The remaining families are considered of little importance to aviculturists and have relatively brief treatment. The section on the owl-eghtjars indicates the difficulty of dealing with rarer species in a work of this kind. The comments appear to be based on the assumption that owl-eghtjars feed mainly on the wing and would present considerable problems. In fact they will readily take food from the ground and have recently been bred in Sydney Zoo. Since Heinroth's breeding of the owl-eghtjar is referred to, it is surprising that reference to the four volumes of *Die Vögel Mitteleuropas*, with all their information on a great range of species, has been omitted from the final bibliography.

In general this new volume of the encyclopaedia is likely to be a useful and permanent source of reference, especially for the general aviculturist who lacks access to a range of books on birds of various regions, or who is likely to need urgent information on some group of birds with which he is not familiar. It is likely to be of special value to the parrot specialist. Apart from the parrots, one is left with the feeling that more could have been done if effort had been directed towards a more general coverage rather than an arbitrary selection of a limited number of species, and illustrations concerned with points of identification rather than inaccurate nomenclature.

C. J. O. H.

* * *

OTIC PETS. By CLIVE ROOTS. London: John Gifford, 1972. £1.30.

The growing interest in natural history has been accompanied by an increasing variety of animals being kept as pets. Unfortunately some of these are quite unsuitable to be kept in households because of their special requirements, apart from the fact that some of them may be potentially dangerous animals. The object of this book is to help people appreciate the time and effort, and in some cases the risk involved, in looking after pet animals and to provide information which will contribute towards lengthening their life span.

The first section deals with fish, amphibians and reptiles and various

examples are considered with recommendations as to their housing and feeding, and a useful chapter on ailments and their treatment.

Section II deals with birds in similar fashion and Section III with mammals. Then follow four appendices dealing respectively with cages, aviaries, nest-boxes, etc.; pet food components; live foods for animals and gestation periods, age at maturity and life spans of some animals kept as pets.

The book is well illustrated and can be thoroughly recommended as a simple introduction to a very complex subject.

E. H.

CORRESPONDENCE

HUMMINGBIRDS RESTING ON ONE FOOT

In the July-August 1972 issue of the AVICULTURAL MAGAZINE, I read an interesting article entitled "The Coronet Hummingbirds" that was written by Mr. A. Mobbs. In this he noted that on several occasions he had observed species of the Genus *Boissonneaua* resting on one foot and that he doubted that the Coronet actually slept in this position since both feet would be required for stability. This is probably the general rule for both wild and captive birds. However, it might be interesting to note that the Philadelphia Zoological Garden received a Chestnut-breasted Coronet, *Boissonneaua matthewsii* in August 1970. Upon its arrival it was found to be missing its left leg. The specimen was immediately placed in exhibit in the Hummingbird House, a large walk-through flight area that contains several specimens and species of humming and non-hummingbirds. Since the bird is alive and healthy at the time of this writing, it is obvious that it has adapted to its handicap.

Another example of a bird adapting to this type of situation is an Emerald Starling, *Coccycolius iris* that was received in April, 1955. In March of the following year, its right leg was broken to the extent that amputation was required. This specimen has since been living in a large flight area which exhibits various medium to larger sized species.

The ability for some birds to adapt to this type of handicap in both the captive and wild state has certainly been noted before. However, there seems to be no note of interest with each example.

PHILADELPHIA ZOOLOGICAL GARDEN,
34TH STREET AND GIRARD AVENUE,
PHILA., PA. 19104, U.S.A.

STEPHEN R. WYLIE,
Assistant Curator of Birds

The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

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Dr. C. J. O. HARRISON

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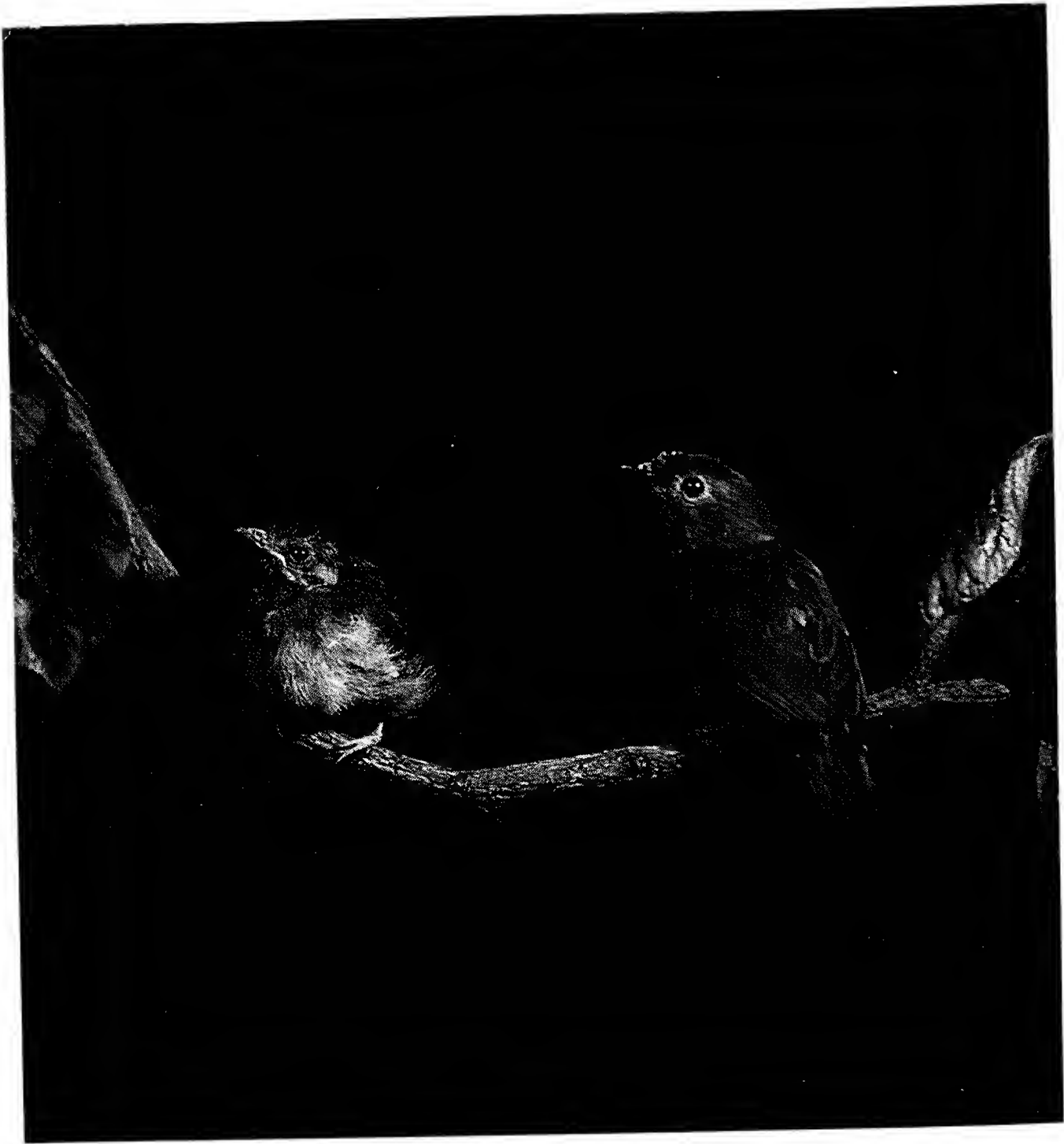
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Blue-backed Manakin and Young

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JANUARY-FEBRUARY 1973

BREEDING THE BLUE-BACKED MANAKIN *CHIROXIPHIA PAREOLA* AT LONDON ZOO

By P. J. OLNEY

The Blue-backed Manakin *Chiroxiphia pareola* has the characteristics of a typical member of its family, the Pipridae. It is a short-toed, stout-bodied, short broad-billed bird about the size of a House Sparrow *Passer domesticus*. In this species the sexes are strikingly different. The male is predominantly velvety-black with a sharply contrasting pale-blue back and a flat somewhat triangular shaped red skull-cap. The legs are pale orange and the eyes are black. The female is far less ornate and is mainly olive-green above with somewhat paler underparts. They are fruit eaters and are found in or by the forests of South America and Tobago. A pair of these beautiful birds have been kept in the Tropical House at London Zoo since 1971—the female since May and the male since December. The house has a flying space of approximately 65 ft. × 45 ft. with a height of 12 ft. The temperature averages 70°F (21°C), and during most of the year there are normal hours of daylight.

The birds rarely appeared to be close together and it was with some surprise that the female was seen to be sitting on a nest in late May 1972. The nest was an ordinary canary-type plastic pan, 4 in. diameter and 2 in. deep, suspended from the wall some 6 ft. from ground level. The nest-pan had been filled with moss, dead leaves and plant fibres, and the female sat, with most of her body exposed, over a small indentation in which lay the two eggs. The eggs were heavily speckled with chocolate-brown spots on a bluish-buff background. One egg measured 25 mm. × 17 mm. and weighed 2.2 grams. Unfortunately the female was already incubating when the occupied nest was first noticed and no accurate incubation period could be recorded. It was thought to be about 17 days. Only the female incubated and the male appeared to take no further part in the proceedings after copulation though in a second attempt at mating he was seen to fly to the nest-pan, settle and begin to shape the nest by turning round while sitting. This behaviour does not seem to have been recorded before as all accounts stress that the female carries out all nesting activities alone.

One egg hatched on the 5th June, the other proved to be infertile. The youngster was fed by the female alone on fruit coated with vionate—

mainly bananas, pear, grape and tomato. Mealworms were seen to be taken to the nest, but were not seen to be given. The fruit was carried in the mouth and bill, and during the first two weeks appeared to be regurgitated but later was fed direct. The partly fledged youngster left the nest after 14 days though it could only flutter from perch to perch and frequently ended up on the ground. As there was considerable danger of it being trodden on, drowned in the moat, or snatched up by a visitor, mother and child were removed to the safety of the Bird House. Here it remained dependant on the mother for a further 14 days, by which time it could fly. The feathering of the head was the last plumage to appear and even when fully winged the adolescent still had a partly bald appearance. Otherwise it was very similar to the female, with olive-green feathering above, and paler plumage below. The legs were pale pink rather than the orange of the adult.

The female was returned to the Tropical House and further nesting activity was seen after three weeks. Two eggs were laid, but proved to be infertile.

Recently, at the beginning of October, courtship behaviour has been seen and this followed closely that described by Gilliard (1959) and Snow (1963, 1971) from birds observed in the wild. As there was only one male involved in this case the interesting and well-recorded coordinated courtship dance in which pairs of males would play an equal part could not be observed.

Two forms of stereo-typed display were seen. In the first the male made short fluttering jumps from a low horizontal steel pipe. The ground around this perch was clear of vegetation and fallen leaves, though it was not known if the bird had cleared away obstructions, as reported in the wild (Gilliard 1959, Snow 1963). The bird would alight on the perch, rise into the air and come down again a short distance from where it started—always it seemed to end up on the perch facing the opposite direction to which it started. In the air it would give a low whirring or buzzing call. The display did not last for very long, and it looked as though the jumps became more rapid and less high as the display continued until finally the bird flew away from the area.

The second type of display was quite different from the jump-display and appeared to be a prelude to copulation. The female was present but partly hidden by vegetation at one end of the display perch. The male rose above the perch, facing the female and almost hovered with shallow rapid rather butterfly-like wing beats. He then landed on the perch in front of the female with his whole body held at an angle so that his pale-blue back and red skull-cap were prominently displayed. The stereo-typed display occurred three times before he flew into the vegetation where he presumably mounted the female. Immediately afterwards he flew the length of the house and then began to feed.

ACKNOWLEDGEMENTS

I am most grateful to the Staff of the Bird House for their considerable help with observations.

REFERENCES

- ILLIARD, E. T. 1959. Notes on the courtship behaviour of the Blue-backed Manakin (*Chiroxiphia pareola*). *Am. Mus. Novit*, No. 1942.
- OW, D. W. 1963. The display of the Blue-backed Manakin (*Chiroxiphia pareola*) in Tobago, W.I. *Zoologica*, 48: 167-176.
- OW, D. W. 1971. Social organisation of the Blue-backed Manakin. *Wilson Bull.*, 83: 35-38.

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BREEDING THE RED-HEADED BUNTING *EMBERIZA BRUNICEPS* AT CHESTER ZOO

By WILLIAM H. TIMMIS

(Curator of Birds and Mammals, Chester Zoo, England)

DESCRIPTION

Emberiza bruniceps is sexually dimorphic; the males are "chestnut" (the chestnut pigment is restricted, however, to the whole head and throat; it extends onto the upper breast.) The sides of the neck and entire underparts are bright yellow; the upperparts, mantle and back are olive-yellow streaked with black; the rump and upper tail-coverts are yellow and unstriped. Wings and tail are brown with pale edges to the coverts and there is no white on the tail. One of our males has the head and throat reddish gold instead of the usual chestnut. There is, according to H. Witherby (1938), great individual variation in the males, especially in the colour of the crown, which is from bright chestnut to golden yellow. The adult female is brown above, streaked with darker brown; the underparts are a mixture of buff and yellow and the rump is yellowish-green with slight brown flecks. The chestnut plumage worn by the male undoubtedly presents the fully adult dress and it would seem from our observations that it is not acquired until the bird enters into its second year.

RANGE AND HABITAT

Although only a rare vagrant to the British Isles, the Red-headed Bunting has quite a wide distribution in the Palaearctic region, breeding from the Aral-Caspian, Transcaspia, Kirghiz Steppes, Turkestan, Semipalatinsk to Altai region, north-east and east Persia, north Baluchistan and Afghanistan. On migration and in winter from September to March it is found in Sind, the Punjab, Rajputana, the North West Frontier and Kashmir, through the central provinces south to the Nilgiri hills. Whistler

(1949) writes that on the spring passage, vast clouds of Red-headed Buntings along with Black-headed (*Emberiza melanocephala*) occur among the ripening crops; on being flushed they fly into the nearest tree, making it appear a yellow mass, and it is noteworthy that these flocks then consist almost entirely of males. These flocks are very bold and are only driven with difficulty from a field where they have decided to feed, and owing to their numbers they can be responsible for a great deal of damage. In the autumn they also do a certain amount of damage to jowar and similar crops but on that passage they are not usually so noticeable. Out of 10 or so species of Buntings occurring in India the Red-headed is possibly the most numerous.

It has no subspecies but in the south its breeding range overlaps that of the Black-headed Bunting (*Emberiza melanocephala*) and Paludan (1940) records that hybrids between *melanocephala* and *bruniceps* are known from the region south-east of the Caspian Sea, males having heads black and chestnut-brown admixed. Meinertzhagen (1954) writing about *melanocephala* in the Balkans and east Afghanistan, where it hybridises freely with *bruniceps*, states that the latter may well be a race of *Emberiza melanocephala*.

As an accidental wanderer, the Red-headed Bunting has been found in Italy, Belgium, Heligoland, Great Britain and Eire. It inhabits open areas with scrub, cultivations with bushes and thick weeds, also arid desert and steppe land with areas of water supporting reedbeds and bushes. Outside the breeding season it is found largely in cultivated areas and scrub jungle.

HOUSING

Two pairs of Red-headed Buntings were purchased on the 26th May 1971 and after a veterinary examination they were placed in an outside aviary measuring 49 ft. 10 in. long \times 10 ft. 6 in. wide \times 5 ft. 7 in. high. At one end there is a wooden shed measuring 10 ft. 6 in. wide \times 10 ft. 10 in. long \times 12 ft. high, which has a clear plastic sheet roof. The policy of screening the faeces of all new additions to the collection has proved especially valuable in the case of new bird arrivals where considerable worm egg burdens are very often seen. It must also be stated, however, that on certain occasions exotic specimens are received with parasitic burdens which do not respond to treatment during the acclimatisation period. The outside flight is heavily planted with shrubs. These include Privet (*Ligustrum ovalifolium*), Golden Privet (*Ligustrum ovalifolium marginatum* "aureum"), Holly (*Ilex aquifoliaceae*), Laurel (*Laurus* (*Polygnum cuspidatum*), Gorse (*Ulex europaeus*) and Honeysuckle (*Lonicera nitida*). A large shallow concrete pool is situated in the centre of the outside flight around which are several types of rushes and sedges. One half of the flight is covered in short grass, the rest being washed river sand. Branches cut from beech trees are fixed at various positions both

the outside flight and inside shed. Other foreign birds kept in the light at the time of the introduction and eventual breeding included various species of Weavers, Java Sparrows, Cut-throats, Green Singing Finches, Diamond Doves, Zebra Finches, Bengalese, Waxbills and Hydahs.

BREEDING

No breeding activity was observed at all during 1971, the Buntings going into moult in late September. During May 1972 one of the males was seen carrying nesting material into a dense clump of Honeysuckle (*Lonicera nitida*). Upon examination, a completed nest was found, this being abandoned two days later due to Weavers taking a great deal of the nest material. The female started building a second nest a few days later, this being well concealed in Honeysuckle which had grown over a short gorse bush. The nest was completed in a little over four days and was a very untidy cup of grass mixed with dead leaves and long stems of Lucerne. It was lined with hair and fine grassy fibres. Most of the nesting material had been placed in the flight for the Weavers and Hydahs, etc.

The work of building appeared to have been carried out by the female alone. I noticed on several occasions that if the nesting material was collected near to the nest site, the male would perch high on a branch nearby, calling very softly, unless engaged in feeding or territorial disputes. As with our Yellow-breasted Buntings (Timmis, 1972), when the female Red-headed Bunting wandered further from the nest, she was generally accompanied by the male, but he was never seen to take an active part in nest building.

Incubation was carried out by the female only. In a total of over 60 visits to the nest, I always found the female incubating, except on two occasions when no bird was present. Three eggs were laid at intervals of a day; the hatching was completed in just under 22 hours, after an incubation period of 14 days. A very interesting observation was the way in which the female positioned the eggs, which were visible from the side and partly from above. Because of this the female put the eggs on the opposite side of the nest so that they always were out of the line of vision of any possible intruder.

I never observed the male feeding the female on the nest during incubation. The eggs were a ground colour, greyish-white, slightly mottled with greenish brown and spotted all over with light brownish and purple markings. One egg which did not hatch was measured in a veterinary laboratory and measured 21×14.7 mm. In the Handbook (Witherby, 1938) Jourdain gives the following measurements of 22 eggs: average 20×15.3 mm.; maximum 22.16 and 21.2×16.5 mm.; minimum 15.6 and 20.2×14.5 mm.

CARE OF CHICKS

The young Buntings were brooded almost continuously for three or four days after hatching and during this period the male was seen feeding the female on the nest. After the period of close brooding by the female she sometimes brooded the young when the temperature was quite high and at other times she left them uncovered when the air temperature was lower; in fact the brooding did not appear to be correlated with a temperature. The location of the nest, under an umbrella of gorse thorus and Honeysuckle leaves, provided partial protection from the direct rays of the sun and from the worst battering of the rain.

The nestlings were brownish above and had streaks of blackish-brown in parts; the throat was yellowish red, turning to whitish yellow on the chest and lower body. The food given by the parents to the young for the first few days consisted of small insects and soaked seed fed by regurgitation. After about three days the young were fed on caterpillars, mealworms, maggots and soaked seed. The nestlings demanded the constant attention of both parents, calling loudly for more food the moment their bills were emptied.

Nest sanitation was carried out by both sexes although it appeared that far more was done by the female and faeces lying around the rim of the nest was removed by the first parent bird to arrive. I found that only the female examined the interior of the faeces. The chicks did not defecate until they were at least 34 hours old, after which they did so regularly, about every two hours, by raising their cloacas towards the rim of the nest before passing faeces. On some visits to the nest during feeding both the sexes would take a faecal sac and swallow it, but most times they would fly some distance down the aviary before dropping it. We found that the male took very little part in feeding the young until they were about five days old, after which the number of visits in which food was brought to the nest was approximately equal for the two sexes. If the female was on the nest when the male arrived with food, or in some cases if the two birds arrived at the nest together, the female generally took the food from the male to give to the young.

The fledging period was 15 days and at that stage the young Buntings looked very like the female, except that they were a shade lighter in color and the bill was greyish-brown above and below. Two Buntings left the nest and for several days perched quite near to the site, occasionally fluttering down onto the ground where they would peck at food when in fact they were not hungry; they also pecked at markings on leaves and the aviary netting. It appeared to be more curiosity than hunger. If the young Buntings were hungry they always gaped and begged, even begged at food which had fallen on the ground, instead of pecking it up.

The adults continued to feed them for almost two weeks after leaving the nest, after which time they had gained strength and ability to fly around the aviary and fend for themselves.

VOICE

The call of the male is a " chipz-chew " with a pause between syllables like a rusty gate swinging back and forth. This is delivered from a bush or tree. In flight the call sounds like " tchirp " in the male and " chawp " in the female. The song consists of a descending phrase with a kick up at the end, usually preceded by four or five preliminary notes. The last phrase is repeated two or three times without a pause; the song has a number of variants. In flight it runs several times together and also at times is speeded up. We have on occasions heard birds singing whilst on the ground.

As described above, the Red-breasted Bunting, *Emberiza bruniceps*, has been bred at Chester Zoo. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Assistant Editor.

REFERENCES

- MEINERTZHAGEN, C. R. 1954. *Birds of Arabia*.
 PALUDAN, K. 1940. Contributions to the Ornithology of Iran. *Danish Sci. Invest. in Iran*, **11**, 11-54.
 TIMMIS, W. H. 1972. Breeding the Yellow-breasted Bunting at Chester Zoo. *Avicult. Mag.*, **78**, 9-11.
 WHISTLER, H. 1949. *A Handbook of Indian Birds*.
 WITHERBY, H. F., et al. 1938. *Handbook of British Birds*, Vol. 1.

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RELEASE OF A CAPTIVE-BRED BARN OWL

(*Tyto alba alba*)

By JEFFREY TROLLOPE (Hounslow, Middlesex, England)

The release and rehabilitation of captive-bred owls has been achieved with planned programmes and feeding support of the birds released. Wayre (1970) has described the method employed for the release and rehabilitation of Barn Owls (*Tyto alba alba*) and Little Owls (*Athene noctua vidalii*). This consists of the release of the young when fledged and feeding them every night on top of the aviary, with the parents kept inside.

DETAILS OF RELEASE

Having bred Barn Owls for three seasons (for first year's results see Trollope, 1971) I decided this year to release one bird as a pilot attempt at rehabilitation. However, living in a very built up, populous and noisy area, the aviary feeding technique used by Wayre could only end in

disaster for the released bird. Therefore I had to find a suitable place for the release, close enough to make nightly feeding visits possible. What I envisaged was a derelict barn or building of large size near a park, or similar area, then to release the bird in the building, which would be used as a feeding site.

This was obviously far from an ideal method, but I thought it worth a try, having postponed such an attempt the two previous seasons. Local bird watchers informed me of a derelict house in a builder's yard, near a large park and golf course, about three miles from where I live. I obtained permission to use it from the manager of the building firm, who was most co-operative.

The bird was released on 7th September 1972. It appeared to be a cock and was the whitest-breasted Barn Owl I have seen, rather paler than most birds on the dorsal surface. It was from a second generation of captive breeding and when released was aged 106 days, weighed 12 oz. and wore a leg ring.

RESULT

Unfortunately the bird left the building on the day of release. This I think was due to three factors:

1. The bird was too nervous to remain in a fairly busy area.
2. The building was not large enough.
3. I released it in the wrong part of the building, where "escape" was too easy.

I continued to leave food in the house in the forlorn hope that the bird would return. Neither the bird watchers or myself could see any sign of the owl during the following weeks. I contacted the local R.S.P.C.A. clinics in case it had been picked up exhausted or injured.

I was consequently both surprised and pleased to see the bird alive and looking fit on the mornings of 8th November 1972 and again on 15th November 1972. On both occasions it was perched on top of a hawthorn hedge which borders the golf course about a quarter of a mile from the release point. Obviously with the winter ahead the bird has a long way to go before it could be considered rehabilitated. However, the fact that a second generation captive bred owl has survived in feral condition without feeding support for just over two months, I consider to be worthy of record.

REFERENCES

- TROLLOPE, J. 1971. Some aspects of behaviour and reproduction in captive Barn Owls (*Tyto alba alba*). *Avicult. Mag.*, **77**, 117-125.
- WAYRE, P. 1970. Breeding results in the Norfolk Wildlife Park. *Avicult. Mag.* **76**, 129-130.

BREEDING THE RED-FRONTED BARBET

(Tricholaema diadematum)

By M. D. ENGLAND (Neatishead, Norfolk, England)

Barbets are close relatives of the woodpeckers and have many of their engaging habits. Their reputation for destroying the woodwork in their aviaries, even to the extent of boring through thick wooden walls and floors, has not made them generally popular with aviculturists, which is a pity, first because they are most interesting birds which well reward study; second because one can suit one's inclinations and have fruit-eating, insect-eating or omnivorous species; third because in my experience their destructive capabilities can very largely be kept within bounds by providing plenty of rotten logs.

The name "barbet" comes from the bristles around the bill (these can be seen in Plate 2) and probably also from the fact that some species have tufts of feathers near the base of the upper mandible. All barbets—and there are over seventy species—nest in holes, some in natural or other bird's holes in trees but most boring their own in rotten timber, and in earth banks or even perpendicularly downwards in level ground.

My Red-fronted Barbets followed me back in April 1972 from East Africa, where I had arranged to meet Tim Barnley who obtained them for me and saw to their transport. In parenthesis I should like to add that it would have been impossible for greater care to have been taken than he took over the packing and forwarding of these and two other pairs of birds which he sent me at the same time: so well-designed and sturdily constructed were the travelling-cages that the air freight cost more than the birds!

This is also an opportunity to pay tribute to the powers that be in Kenya for the way in which they control the export of their birds. A permit to trap a bird, or birds, of a particular species has first to be obtained, the decision to award or withhold it being in the hands of a committee which meets monthly in Nairobi, and before the permit is forthcoming the trapper has to pay a fee equivalent to 10% of the amount which he will receive for the birds. This permit is for a bird or birds of a given species, and alternatives are not allowed: for example, to make things easier—as I thought—I asked for one pair of either of two species of barbet, but this was not allowed and I had to specify exactly which. How very cheering it would be if all countries would adopt a similar attitude to the trade in their native birds, so that a stop might be put to the excessive drain upon the wild which is now going on.

Red-fronted Barbets are locally common from Southern Sudan and Central Ethiopia south through Kenya and Uganda to Tanzania and Malawi, and they are inhabitants of the bush country and especially in acacia woodland near water-courses. With the exception of Tinker

birds they are among the smallest members of the family, being about nuthatch size though rather shorter and plumper, and their habits and general deportment might be described as a combination of nuthatch and small woodpecker. They are generally black above with yellow streaks, and white to yellowish-white below; some birds have the very faintest trace of brown spots on the lower breast. They have a bright red forehead and pale yellow superciliary stripes shading backwards into white. They have a moderately long, stout black bill and dark grey legs. The sexes are alike in plumage.*

When mine first arrived they very obviously disliked the cold of a British April—or rather the 60°F at which my bird-room was kept, and they looked very unhappy until I put an infra-red lamp on them, although they fed well from the start. After a week or two they were allowed into the flight—24 ft. × 4 ft 6 in.—and, despite miserable weather, they immediately improved. They are not happy in close confinement, even though in this case the “confinement” consisted of a section of birdroom 8 ft. × 5 ft. × 4 ft. 6 in. Needless to say I gave them no companions.

It was not long before I was fairly sure that I had two birds of a sex probably males. One was aggressively dominant to the extent that the other began to skulk in the shelter, seeming unwilling to go out into the flight when the other bird was there and only dared to snatch a bit of food while fearfully “looking over its shoulder”. On the other hand only the dominant bird was noisy while the other has never been heard to utter a sound, but I was pessimistic enough to think that this was due to their very unbalanced relationship rather than to the fact that they were male and female, especially since vicious chasing had begun and I was beginning to consider the need to separate them. My pessimism grew worse when one of them took over a nest-box at the far end of the flight while the other started boring a hole in a rotten tree-stump in the shelter. However, gloom eased a little when relations improved sufficiently for both of them to take turns at boring.

Their method was interesting: each would attack the wood, hammering away until a piece was loosened at one end; this was then seized and torn off and, when a large beakful was free, it was carried to the far end of the flight and dropped on to an ever-increasing heap. Amazingly, small pieces of wood were swallowed and *regurgitated* on to the heap; practically nothing remained beneath the hole to give away the site to enemies. The entrance hole was small for the size of the bird—a very tight squeeze—and was not perfectly round but rather irregular like that of a Willow Tit *Parus montanus*.

Hopes really did soar when courtship feeding and then mating were seen (the dominant bird was the male), and one bird began spending long periods in the hole. Meanwhile, relations continued to be intermittently violent.

* Subsequent close examination has shown that in this pair the male has rather more red on the forehead than the female.



Copyright]

[M. D. England

Adult Barbet at nest-hole. Note nest-cavity, opened up by the birds, at foot of picture



Copyright]

[M. D. Englinc

Male Red-fronted Barbet at nest-hole. Note the shape of the bill which is used for gripping and tearing

strained, and the vicious chases were all the more alarming since they did not culminate in mating, and appeared to be done out of pure spite. Whatever their cause, there can be no doubt that the female spent a great deal of her time absolutely terrified of her mate. Mating took place in a most casual manner, with no preliminary display, after the two birds had one of their rare periods of sitting peacefully side by side preening. Far more often than not it was unsuccessful.

Any hope of breeding disappeared when one morning it was seen that there was a gaping hole in the side of the log: they had opened up the nest cavity, whether from inside or out we could not tell. So that was that, and "summer" was fast passing. A new log was put up in place of the old (they had in fact a choice of five logs in the aviary), but they ignored it and it seemed as though even their very half-hearted desire to breed had left them. In a final attempt to stimulate them I cut a hole in the bark and exposed the soft wood within—immediately they started to bore. Again they took it in turns, and again they carried their winnings to the far end of the flight, where they filled their bath with them. Since they are reputed to favour the vicinity of streams for breeding, one is tempted to wonder whether this depositing of wood-chippings in their bath was the equivalent of dropping them in a stream where they would be carried far away from the vicinity of the nest-site.

Although it was impossible to be quite sure when it started, there was soon little doubt that incubation was taking place, since frequent nest-relief was seen. The relieving bird did not by any means always wait for its mate to leave the nest, but either clung to the tree outside the hole (presumably making a noise that I could not hear) or went inside and down to the cavity. Sometimes both were in together for quite long periods. This made it equally impossible to be sure when hatching took place, but it was a few days before the 26th August, on which date my diary reads: "R-f Barbets feeding hard, mainly on chopped lettuce. Swallow food and regurgitate—do not carry it in bill. Do not always allow very long for digestion, sometimes as little as two minutes."

For the first few days chopped lettuce and chickweed was the favourite food, but the youngster's menu was gradually enlarged until it was being fed on the widest variety of food that I have ever experienced—all, of course, regurgitated by the parents: chopped lettuce, chickweed, grated cheese (little), chopped hard-boiled or scrambled egg-yolk, soft food, chopped raisins and currants, apples, mashed carrot (little), maggots (few), mealworms and small locusts. Until 9th September (that is for over a fortnight) one parent was almost continuously in the nest, and from 1st September faeces were seen to be carried away; presumably it had been swallowed prior to this.

On 9th September, and thereafter, both parents were off most of the time, though both continued to visit the hole to feed at frequent intervals—surprisingly frequent considering that regurgitation was employed.

During this time persecution of the female by the male intensified, to be interrupted occasionally by brief periods of truce when courtship-feeding and mating took place. On 22nd September a youngster was looking out of the hole and was being fed by the male with egg-yolk in beakfuls, not swallowed and regurgitated. The female continued to feed by regurgitation, using a rapid "pumping" action with the bill inserted far into the youngster's gape.

On the 23rd our hopes received a crushing blow—the nest-compartment had been torn open again and there was no sign of a youngster: a thorough search of both flight and shelter failed to find even feathers, the nest had not even any broken egg-shells in it, and the parents seemed completely unconcerned. I was miserably leaving, after another fruitless search, when a very faint noise caught my ear—and there was a youngster looking out of the hole; it had been "up the spout" all the time, clinging between entrance hole and nest-cavity. That night it descended to the nest to roost (in full view, of course) and the next morning left it for good. Rather unexpectedly it did not return to the hole at night, but roosted out in the flight with no shelter whatever. Meanwhile, the female parent had dug herself a roosting hole in another tree, which she continues to use.

As will have been gathered, there was only one youngster, and no evidence at all of there ever having been more, or more than one egg. The one which was reared, however, was fully developed on leaving the nest, and was indistinguishable from its parents except on very close inspection, which showed that the small patch of red on the forehead which gives the bird its name was replaced by black. A very faint mewling, to human ears audible only from a few feet, which was heard on its last day in the hole, and again when it was caught up for ringing, is the only sound it has been heard to utter, and its mother never seems to make any sound at all. The male has three calls, one of which—a not very loud he-he-he—very similar to the call of the Lesser Spotted Woodpecker, *Dendrocopos minor*—was heard a few times only when the birds first arrived. His main breeding-season call is a rapid version of the "poo" of a Hoopoe *Upupa epops* repeated six or more times, often though not always, with an accelerando towards the end. This is uttered with the bill pointing downwards and the throat "blown out" in a similar fashion to hoopoes and coucals. His other call, which is probably a contact call and, I suspect, would also be used by the female were she not so persistently in a cowed state, is almost exactly a louder version of the call of an Owl Finch (Bicheno or Double-bar) *Poephila bichenovii*., rasping nasal *aark*.

SUMMARY

The breeding in an aviary of Red-fronted Barbets *Tricholaema diadematum* is described. They bored a hole in a rotten stump of Silver Birch *Betula pendula*, but this was left unused after they had broken open the nest-cavity. A second hole—in another log of rotten Silver Birch—

was bored by both birds and one youngster was reared in it. This was fed by regurgitation by both parents, which also shared incubation and brooding. Incubation and fledging periods could not be ascertained, but the latter was certainly in excess of 28 days, though probably not much so. On the last day before the youngster left the nest, the nest cavity was opened up in a similar fashion to the previous one, as also was the hen's roosting hole.

* * *

As recorded above, the Red-fronted Barbet, *Tricholema diadematum*, has been bred by M. D. England at Neatishead, Norfolk; it is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species is requested to communicate at once with the Assistant Editor.

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PARROT NOTES

By GEORGE A. SMITH (Peterborough, England)

In my article on nesting and nestling parrots (AVICULTURAL MAGAZINE, 1972, pp. 155-164) I was foolish enough to write that parrots appear to make no attempt at nest sanitation. This is certainly not true for Black-headed Caiques *Pionites melanocephala* and with hindsight have reason to suspect that it is untrue for other parrots. Parent caiques scratch the soiled litter out of the nest-hole and continually chew splinter from the inside of the box to refurbish the floor covering. It was only when the supply of soft wood, nailed inside the box for this purpose, was totally chewed away that the nest became fouled by the chicks.

This could well be the explanation of two puzzling features of brush-tongued parrots (Lories). Why do these birds, lapping nectar and eating soft, yielding vegetable substances need such a powerful bite to their beaks? Keas, for example, which are the size of a Raven are caught by an ungloved hand to be leg-rung, or killed for government bounty money, without giving the handler other than the slightest inconvenience (Jackson, in corres.). I only hold lories, as other parrots, in my naked hand after catching and positioning them in a hand-net as they can give nasty, blood-drawing bites.

My second perplexity with brushed-tongued parrots was as to why the youngsters, in captivity, are almost invariably badly plucked while in the nest? Some other "sorts" of parrot chew their youngsters' feathers. Mostly, I feel, for some aggressive reason as the skin is often marked and the head often suffers; but with lories it is the whole body, save wings and tail, and the head feathering is left intact making them look as if they had had a "pudding-basin hair-cut".

I now believe, partly proved by the manner in which nest-boxes are "eaten" by these birds, that in a "natural" nest cavity the parents would rain-down—by chewing—a periodical shower of parings to absorb the faeces of the young. The plucking of the chicks can then be seen as done to "satisfy" this parental instinct. Dilger notes that soiled nests stimulate parent lovebirds to fetch further quantities of nest litter. This need to pare would satisfactorily explain the powerful bite of these birds.

While on the subject of nests much has been made of a species of moth whose larvae feed in the nest litter of the Golden-shouldered Parrakeet *Psephotus chrysopterygius* (e.g. p. 109 in Immelmann's *Australian Parrakeets*).

My own nest-boxes commonly house two species of moth: the Clothes moth and the Flour-moth—which, if my (schoolboy) memory serves me right, is *Espehtia kuhniella*. The Clothes moth feeding on feathers and "scruff" and the Flour moth, in its cobweb tube, living on the rich organic dust thrown up by the birds. Most damp nest-boxes have Housefly *Musca domestica* maggots feeding in the top layers by the late summer and early autumn; perhaps a more careful survey would reveal more cases of "commensalism".

In their article on the behaviour of some African parrots the Holyoaks (AVICULTURAL MAGAZINE, 1972, p. 89) suggest that Budgerigars and Grass parrakeets *Neophema* spp. hold food steady by standing on it when they eat. They also say that *Poicephalus* parrots pick food items directly up with the foot and then transfer it to the bill. I have tried to entice literally scores and scores of Budgerigars and Grass-parrakeets to use the feet when feeding on millet spray and Annual meadow-grass *Poa annua* pannicles. I tried to present this in such an awkward way—part pushed through the wire or laying across a perch—that they should find it easier to use the foot than to feed directly. I have yet to see a Budgerigar even attempt to use its foot. Brockway (1964, *Behaviour* 22, p. 200) who has made a detailed study of Budgies says that they make no feeding use of the feet. Some individual Grass Parrakeets will use their feet to clasp food to the perch—especially Blue-winged and Elegants *N. chrysostoma* and *N. elegans*—it is less common in Turquoisines *N. pulchella* and I have yet to see Splendids *N. splendida* or Bourke's *N. bourkei* involve the feet in any way. Because the inability to use the feet is a recent development it would be highly improbable if all Budgerigars or grass-parrakeets were incapable of using the feet.

But for the two exceptions listed in my article on the use made by parrots in feeding (AVICULTURAL MAGAZINE, 1971, pp. 93–100) I have not seen a parrot directly take an item up in the foot. The following letter from Mr. Mats Tell of Ljungbyhed, Sweden, has some interesting points on the use of the foot. He writes: "I should like to report two rather interesting observations on my own birds.

1. TURQUOISINE GRASS PARROT

A 1969-bred cock was seen, for the first time, using his feet when feeding in the 1971 breeding season. When rearing chicks, he was every day given large quantities of different green food. He would then fly down, bite off a clover blossom, grasp it in his foot and eat it just the same way as a Rosella. I have never seen him handle other green food in this way, although I think dandelion seed-heads would be very suitable. None of the young have hitherto developed their father's unique habit, nor have I seen or heard of it before. None of my friends, many of whom have fine *Neophema* collections, have ever seen it among their birds.

2. STANLEY ROSELLA

One of my cocks is especially fond of pears. Fallen pears are often pecked upon by wild Blackbirds and Fieldfares and I often throw these into the Stanley aviary (of course I never normally give my parrots fruit on the floor). This particular cock often bites off a considerable piece and eats it, holding it in his 'hand' in a normal way. However, when disturbed—say, when a Buzzard is flying over—he drops it and, still watching the Buzzard, picks it up again *with the foot* when the 'enemy' is too far away to be considered as a danger. All my other Stanleys (when in a similar situation) pick up their food with their bills."

It is rather difficult to obtain certain information on behaviour and I would be most grateful if someone could tell me whether male Amazon (*Amazona*) and Red-vented (*Pionus*) parrots when pairing, like all the other observed American parrots, keep one foot on the perch and place but one on the back of the female? All the Old-world parrots stand with both feet on the back of the female.

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BIRD BREEDING AT CLÈRES IN 1972

By Jean DELACOUR (Clères, France)

Practically every year one has to state that the weather has been unfavourable, in one way or another, for the welfare of exotic birds in the supposedly privileged climate of North-Western Europe, and 1972 was no exception.

At Clères, after a warm month of March, April, May and even early June were unusually cold, windy and dry, and so, on the whole, was the summer. That indeed interfered with the satisfactory reproduction of many species, and numbers of infertile eggs resulted, as males simply failed to come into breeding condition at the proper time. It was very disappointing. But let us forget failures and remember mostly successes.

The two pairs of Emus again did well, producing 26 young. The Rheas however again laid very late, and only two (one white) were raised.

Wattled Cranes and Demoiselles laid clear eggs, but we reared a Black Crown Crane. Since 1920, when some of those birds first arrived at Clères, this is only the second time that eggs have been laid. In 1939 a mixed pair Black \times Grey had nested, building in August a large nest of seeds and grass and laying three eggs. They all hatched and the young were reared, only to disappear at the beginning of the war.

There are at present in the park and gardens seven Black and ten Grey Crown Cranes. This year, a pair of Blacks set up a territory and laid close to the fence along the river. The nest was very small and only two eggs were laid. The parents were wary and the female often left the nest, finally deserting the two chipped eggs for some unknown reason. They were picked up cold, but one chick was saved and successfully hand-reared.

A pair of Black-necked Swans nested twice, first in March, then again in July, after they had reared the first brood. They hatched six, then seven cygnets, but reared three and four only, the female killing several chicks after a couple of weeks, a very strange performance.

Two pairs of Cereopsis Geese, each isolated in a large meadow, hatched and reared 12 goslings, both in February. Other goslings raised included Swan, Greylag, Snow, Bar-headed, Giant Canada, Néné, Black Breasted, Magellan and Ashy-headed. Several Emperor and one Ross's chick died by accident. A special mention must be made of two young Red-breasted goslings reared; a poor performance as we have seven pairs on the grounds. One of them is partly albinistic; while the head and neck are hardly paler than in normal specimens, with the usual complicated pattern, the rest of the plumage is generally grey instead of black, with pale grey blotches and white markings.

There were a number of Common, Ruddy, South African and Paradise Shelducks; also 17 Moluccan Radjahs from one pair which laid the

clutches clear; the old pair of Australian Radjahs, the last one in Europe as far as I know, again laid eleven eggs; I am afraid they are past the age of successful breeding. A brood of 11 Maned Geese was raised by the mother.

A number of various ducklings were lost owing to an epidemic of salmonellosis, for the first time at Clères, but others were reared, both in pens and at liberty, including Yellow-billed, Indian Spot-billed, Pacific-grey, Philippine and Hawaiian Mallards; Gadwalls, Pantails, Shovellers; Bahamas; Mandarins and Carolinas; Puna, Silver, Cape, Sharp-winged Teal; Pochards, Red-heads, White-eyes, Australian White-eyes, New Zealand Scoup. Unfortunately, unwanted hybrids cropped up, particularly Baer Pochard \times Chestnut Teal, Brazilian \times Chestnut Teal, Brazilian \times Kerguelen Pintail, Chiloe \times European Wigeons. The first mentioned are handsome, intermediate in shape between the parents, the male a bright, purplish-chestnut shot with metallic reddish all over.

An interesting incident occurred with an old pair of Silver Teal, which had long been secluded on a small pond for breeding purposes, but had failed to produce healthy chicks the last few years. They were released on the lake to make room for a younger pair, the result being a happy one: the old birds did rear there three perfect youngsters.

Game birds were not very successful. The world is now so polluted and infectious diseases so widespread that it becomes difficult to cope with such dangerous conditions, particularly on grounds where they have been kept for so long. Only Junglefowl were raised in numbers. Jabouille's Red, Ceylon and Sonnerat's, and of course the commoner species such as Golden, Amherst's, Swinhoe's, Silvers. But we had only a few young Siamese and Malay Firebacks, two Monals, seven Edwards', many peafowl, and one Bare-faced Curassow (*C. fasciolata*). The Brush Turkeys did poorly, although nests were well built and attended, only one chick came out.

Many Pigeons and Doves were reared: Olive (*C. arquatrix*), Wongas, Bar-tailed (*M. unchall*), Mountain Witch, Bleeding-heart, Lemon, Bronze-winged, and several other more ordinary species.

The number of Parrots kept at Clères has to be somewhat limited as we do not particularly enjoy the bare, unplanted aviaries required by these destructive birds. There are however two free-flying Macaws, female Red and Blue and Blue and Yellow, plus a somehow crippled male of the latter species (*ararauna*). No more can be let out as the resident birds would drive them away. There was a nice colony of Quaker Parrakeets at liberty, but local Jackdaws, which breed on the high walls of the chateau, incessantly attacked them, taking over their huge nests of twigs, and finally they went away.

Some 20 specially built aviaries are inhabited by Cockatoos (including headbeater's), Macaws (Leah Ambiguous), Amazons and other Parrots and Parrakeets. Two Crimson-winged were reared and Bourke's breed

in a large planted flight, as they are almost the sole members of the family they do not damage vegetation.

Seven species of Touracos live at Clères but only one, Knysna, have bred successfully this year, two pairs producing six young, three of which reached maturity. A regrettable accident took place after two young, just out of the nest, were removed when the male, evidently disturbed, killed the female.

Three Kookaburras were hand-reared, the eggs being removed and hatched in an incubator, as the parent birds have developed the habit of devouring the chicks as soon as they are out of the shell.

We had some success with Passerine birds. Over 20 Superb Sparrows, several Diamond Sparrows, and two Baltimore Orioles were raised in the aviaries, the latter species probably for the first time in Europe. We also hand-reared five Fairy Bluebirds, three Orange-headed ground Thrushes and one Fulvous-fronted Parrotbill (*Paradoxornis fulvifrons*), all of them taken from the nest when eight to ten days old. Several broods of these species had met with failure in aviaries earlier in the season, the chicks being killed in the nest by other birds when the mother began to leave then unattended during the day, or soon after they had left it. The breeding of a small Parrotbill, or Suthora, is probably the first of that genus in captivity. All these hand-reared birds are, of course, delightfully tame.

Black-eared Weavers (*Malimbus melanotis*) built several beautiful hanging nests and laid, but no chicks came out. Rothschild's Starlings, White-winged Blue and Black-faced Scarlet Tanagers did not rear their young this year. Tacazze Sunbirds also failed and a female Violet-eared Hummingbird built several nests without laying. A deplorable loss was that of a cock Scarlet-necked Tanager (*Anisognathus igniventris*), killed by another bird (possibly a Pink-crested Touraco) when a brood of two had just hatched in a privet bush. The female failed to raise the chicks

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BREEDING OF THE ROOK, *CORVUS FRUGILEGUS*, IN CAPTIVITY

By DR. PETER R. RICHARDS (Cookham Dean, Berkshire, England)

I have been interested in the Rook for many years, and have been keeping them in captivity since 1951, when I had hand-reared my first fledgling. I qualified in Medicine in 1959, and as I had to take a resident appointment in hospital, I reluctantly passed on my birds to Dr. Bombs, of Perren-ar-Worthal, in Cornwall; but from 1966 onwards I was able to keep the Rooks again.

The birds live in an aviary, which is situated in my garden. It is 10 ft. wide, 24 ft. long and about 8 ft. high. It is irregular in shape, and is built between two large elm trees. The floor is earth, and turves of grass are laid every few months, but are rapidly destroyed by the birds.

There are no natural perches, but artificial perches are provided in many parts of the aviary. As some of the birds are crippled with injured wings all the perches are near to the ground to enable the birds to climb up if they cannot fly.

The aviary is surrounded with 1 in. mesh wire netting. Some protection is provided from the rain, by means of corrugated polythene sheeting, but that is all.

Nest sites are provided, by selecting branches with natural forks and cutting them to suitable lengths. They are then placed in the aviary about 6 ft. apart. Rooks show an interest in nesting material at all times of the year, except in mid-summer when they are going through the post-nuptial moult. I find there is no difficulty in inducing them to use these nest sites, but, as it takes rather a long time for the birds to lodge the first few sticks in the fork and form a foundation, I usually assist them by tying a few twigs into the site I have selected. I choose a site about 10 ft. from the ground, and in a position where I can clearly observe the nesting behaviour.

There are no other species of birds in the aviary now, but at one time there were some jackdaws, *Corvus monedula*.

A bath is provided in the form of an upturned dustbin lid, and the water is changed daily. All the birds take at least one daily bath.

In 1966 I started keeping Rooks again, this time finding a late fledgling on 1st June, in Norfolk. This bird turned out to be a hen, but unfortunately I was unable to acquire a mate for her until the summer of 1968. This pair are later referred to as Pair A.

Nothing daunted this hen fell madly in love with my collie bitch, and in April 1968 laid a clutch of eggs. These inevitably were infertile, and I put some wild rook's eggs under her. She hatched these, but alas the young perished from starvation after a few days, because at the time

I did not realize the female rook contributes practically nothing to the nourishment of her young until they are well feathered.

The following year in 1969, she laid again, in the meantime pairing with a crippled cock rook with an injured wing. Unfortunately, this was unsuccessful, as the cock ate every egg she laid, and has done so ever since.

In 1970, this Pair A laid again, but her eggs were again eaten. By that time I had acquired several more rooks, so that in 1971, I had three adult pairs and some yearlings. A hen that had been brought to me in 1969, aged two years, and another old cock rook with a broken wing, had paired up (Pair B). They made a fine nest in early 1971, starting building on 27th February and completing by 25th March. She laid four eggs, the first on 28th March, and the last on 4th April. They hatched after 19 days incubation, the first on 15th April and the last on 19th April. I was not adequately prepared regarding the amount of food that the young would require, and the young perished by the 25th April. She laid a second clutch of eggs, between the 4th and 8th of May, but none hatched.

In 1972, I still had the original hen, but the cock I had given to my friend, and alas the hen has made no effort to pair with any other rook and did not nest at all.

The second pair, Pair B, that bred in 1971, started nest building on 4th March. They chose a new site as a younger pair, Pair D, had usurped their original site, and had built a nest that contained eggs by the 8th March. The nest of Pair B was completed by the 12th March, and she had lined the cup of the nest by the 13th March, and was becoming broody and begging constantly for food with a wing shaking, juvenile gesture, and the typical, high pitched caw that is so prevalent in rookeries at this time of the year.

Nest site selection seems to be made by the hen, but nest building is conducted by both sexes. Much of the material is brought by the cock and the actual construction is largely conducted by the hen. The hen contributes largely to the lining.

Perfectly adequate nests can be built by single birds of either sex, and I have found that cocks who have lost their mates will continue to complete a nest, and hens, for example A, can build and complete a nest in the absence of a suitable mate.

The first egg was laid on the 15th March, the second on the 16th, and the clutch was complete on the 22nd March, consisting of six eggs.

Incidentally, Pair D suffered from the same fate as Pair A; the cock ate all the eggs. He was released, and can be seen strutting about Hyde Park and Kensington Gardens, one of the only two resident rooks in Central London. The hen accompanying him was also one of my birds, a particularly aggressive bird that I released at the same time because of the trouble she caused with my little colony.

The hen of Pair B sat well and was regularly fed throughout incubation.

by the cock. The first two eggs hatched on the night of 2nd April (19+18 days) and another egg hatched on the 3rd April (18 days). The fourth egg hatched on the 4th April (18 days) and the fifth egg, unfortunately, cracked and the young died in the shell. The sixth egg hatched on 6th April (16 days).

The young were grey-skinned with orange gapes when hatched, but quickly grew until they had doubled their size by the fourth day, when their skin had become quite black, and their gapes changed to carmine pink. Feather tracts were making their appearance by this time. The male rook was entirely responsible for feeding the young. The female brooded all the time, only getting off the nest to stretch herself and uncover the young when the male came to feed. Oddly enough, as has been noted in the wild, when the cock arrived to feed the young the female begged intensely for food, and only passed food onto the chicks when her own hunger was satisfied. It was difficult to supply enough maggots, for feeding the chicks, as these were used to the exclusion of everything else, and the other rooks in the aviary also would eat up any maggots I supplied in preference to their usual diet.

By 11th April—8 days, the first feathers on the back were through, but unfortunately the food supply was not meeting their demands, and on the 11th the youngest chick died of starvation, and on the 12th another died, so I decided to hand-rear the remaining three myself.

The chicks that survived were ringed on the 12th April, aged 10, 8 and 6 days. On the 13th April the oldest chick's eye opened, aged 11 days, and the smallest chick remaining died, leaving me with only two.

By the 17th of April the two chicks were gaping at my finger, and their sight was obviously quite good.

Fortunately, although I hand-reared the first two chicks successfully, on the 19th April the hen bird started relining her nest again. I had reduced the number of rooks I was keeping from ten to six, releasing some birds in Hyde Park.

The progress of the hand-reared rooklings was as follows:

By 14 days the feathers through on the back of the head, the back, the scapula region and the primary and secondary flight quills were growing fast. They grew very rapidly on a diet of chopped-up, day-old chicks and a mixed mash of Lowes Meat Chips, layer pellets, bread soaked in egg, corn, farlene, Sluis soft-bill, and groundnuts, on which the adult rooks are basically fed.

By 21 days they were standing up and attempting to preen, their flight feathers were about 1 in. long, and their legs had reached adult size. By 25 days they were standing and flapping their wings and their head and body growth was approximately completed. By the 27th day they were standing on the edge of the nest, and on the 28th day they could stand on one leg and scratch. By the 30th day they perched alongside the nest, and by the 33rd day they could hop from one side of the

nest to the other. On the 35th day they could fly adequately. Their wings were able to support their weight, but their tails were still about half grown. It was not, however, until the 44th day that their wings and tails had become fully grown, and they were not feeding completely independently until August, although they could pick up food for themselves by the 11th June (69 days). One of the two hand-reared birds escaped, a hen, but the other, a cock, is alive and has moulted well.

A second brood followed a similar pattern, but by supplementing the food supply by hand, the young in the nest had adequate supplies of food with the food brought to the young by the cock bird. I was able to rear two chicks in the nest to maturity and to observe their parents' reactions and behaviour.

The hen began to reline the nest on the 19th April, and the first egg was laid on the 21st April. The clutch was completed by the 26th April and consisted of five eggs. The first two hatched on the 9th May, and no others hatched, although one egg disappeared. The cock bird was observed to remove the eggshell when the first egg hatched. The chicks grew and behaved very similarly to the first brood, but because the rooks were better at nest hygiene than I could be, numerous observations were apparent that I missed in the hand-reared, first brood. The chicks were covered with a fine down by eight days, and the parent birds spent a lot of time preening and cleaning the young birds.

By the 19th day the young were well feathered, and the parent birds who up until this time tolerated my presence at the nest without getting upset began to get very alarmed. My presence would cause great consternation and alarm calls, the harsh grating caws were uttered, upsetting all the other rooks, and the young rooks that I was feeding at about four hourly intervals ceased to beg for food, and cringed in the bottom of the nest. The hen bird ceased to brood the young continuously on the 29th May (21 days) and was seen to collect food and feed them herself for the first time. She did not brood again after 3rd June, by which time the young were 26 days old and were standing on the nest and flapping their wings.

On the 7th June (30 days), they perched on sticks near the nest, and they were flying by the 9th June (32 days). They, however, still returned to the nest to roost until they were 34 days old.

The hen rook was responsible for most of their feeding, after leaving the nest, the cock rook having started moulting.

I still have one of the first brood, but I exchanged the young of the second brood on the 30th June, aged 53 days, for some other birds.

The young birds were not molested at all by the other adult birds at any time. The parent rooks defended intensely the immediate tenancy of the nest, in a radius of about one metre, and would not permit any other bird within this area, the hen's territorial aggression being more intense than that of the cock, which I have noted with all my rooks. When

young left the nest they seemed to be quite confident of themselves, and showed aggressive postures to strange birds that approached too close, and were respected by other birds in the aviary. In fact, the young birds have always been quite high in the hierarchy within the aviary. It is only in autumn when the adult birds have completed their moult, and are sexually highly active again, and the young birds are not showing any overt sexual behaviour that they have slipped in the social hierarchy.

I think the successful breeding of these birds can be attributed to there being a stable colony in which the individuals interact and stimulate each other, and also to the large amount of live food in the form of maggots and wax-moth larvae they receive.

I must say that since receiving the regular supplies of live food their plumage has improved, and even in the wettest days their feathers retain their sheen and water-repellant qualities.

As described above, Dr. P. R. Richards has bred the Rook, *Corvus augilegus*. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

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BREEDING THE CASQUED HORNBILL AT "BIRDWORLD"

By MRS. P. M. HARVEY (Holt Pound, Farnham, Surrey, England)

Early in April it was noticed that the pair of Casqued Hornbills, *Canistes subcylindricus*, we had had for two years appeared to be coming to breeding condition. They spent a lot of time preening and feeding each other, the cock bird feeding the hen with far more animal food than usual, this consisting of mice, chicks, meat, etc.

We placed a barrel in the large flight on 29th April taking care to place the entrance hole to face away from public eyes, and so give as much privacy to the pair as possible, should they make any attempt to nest.

On 5th May the birds started to mud up the hole in the barrel with some lumpy soil provided by the keepers. The cock bird did most of this work, with a lot of interest and a little help from his mate. By 15th May the hole had become very small and excitement of all the staff mounted on the 17th May, when the hen had become completely sealed in, leaving only a slit for feeding purposes. It was interesting to note that excrement was carefully forced out through this same hole. The nest must have been spotlessly clean, while the area outside was getting progressively dirty, but we of course left well alone.

At the end of May and beginning of June we began to get rather worried. Feeding habits fluctuated violently, in fact on some days little food at all

was taken. On 9th June we offered locusts which seemed to act as an appetizer and to our relief other food increased, but strangely enough mice and chicks, not so long ago a favourite food, were now refused completely; locusts and mince with a little fruit now appeared to be the order of the day.

On 28th June, 42 days after completion of mudding-up, a baby was thought to be heard squeaking and on the 29th definitely one chick was observed through the slit in the hole. Little fruit was now taken, but locusts, mice, young rats, cut meat and day-old chicks were eaten profusely, the food intake increasing steadily throughout August.

The cock bird was a very dutiful father. When given a fresh supply of locusts, it was his habit to immediately take each one up to his mate, seldom helping himself. In fact August proved a very busy month for him, for more and more food was demanded by the hen bird, who was constantly banging on the side of the barrel to attract attention.

On 8th September, to the surprise of us all, during the morning three beaks were seen at the hole! Imagine the excitement of all at "Bird-world". Mum and two chicks were all demanding food from poor father.

The family had now been in the barrel home for four months. We thought perhaps it was time they were venturing out into the world. Should we give them a little help by making the hole a little larger? Or let Nature take its course? My husband sat down one evening and read all the literature he could find on hornbills, one article read that it was thought that some of the larger species did in fact stay in their nests as long as 4½ months and so, as the pair had done so well without interference from us, we decided to leave well alone; which proved a wise decision. 124 days after the hen was first mudded-in the barrel, on 17th September at first light, two large knocks at the mud and out she stepped, quite calm and very clean in her new plumage, having gone through the moult while in the barrel.

The cock bird however was far from being calm, flying from one end of the flight to the other in great excitement, and to some extent, we felt rather frightening the youngsters, who kept putting their heads out of the hole to see what all the fuss was about but not daring to join the parents. The first ventured out at 9.32 a.m., the second two hours later at 11.34 a.m., in rather an undignified manner, just missing the branch his mate had jumped to and falling like a stone to the ground. It did not take him many minutes to find his wings and join the rest of the family.

The young birds could fly very well as soon as they left the nest, perfect miniatures of their parents, with a spotlessly clean black and white plumage and about three-quarters grown. The nest that they had left was quite unsoiled and the birds never returned to it.

For the following five to six weeks the parent birds both fed the fast-growing babies. Now, of course, at three months they are quite self-supporting. The beaks are still much darker than the older birds and give the impression that they are both hen birds.



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[P. M. Harvey

Young Casqued Hornbill on the day it left the nest

1870-1871

The credit of this achievement is of course the birds, but we at "Birdworld" like to feel we helped a little by providing the situation and food necessary for this breeding in captivity.

As described above, the Casqued Hornbill, *Bycanistes subcylindricus*, has been bred at "Birdworld". It is believed this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

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BREEDING THE CRIMSON-RUMPED OR SUNDEVALL'S WAXBILL AT CHESTER ZOO (*Estrilda rhodopyga*)

By WILLIAM H. TIMMIS, Curator of Birds and Mammals

The Crimson-rumped or Sundevall's Waxbill is found from the Central Sudan to Eritrea, Abyssinia and western Somaliland where it is reported to be quite common locally in small parties, feeding on seeding grasses and it is said to be extremely tame.

The adult bird is about $3\frac{1}{2}$ inches in length, mainly brown above, slight greyish on the head and with crimson on the rump, edge of tail and along centre of folded wings; a broad crimson stripe runs through the eye; bill black; face, throat and foreneck white; breast and belly pale brownish-tuff. Finely barred above and below. Two races are recognised: *E. r. rhodopyga*, which is rather paler, and *E. r. centralis*, this being rather darker below.

We have found it very difficult to distinguish the male from female, but it appears that the red through the eyes and on the rump is a much deeper colour and that the white on the throat is brighter and slightly wider in the adult male. Three adult Crimson-rumped Waxbills were purchased from Lady O. C. Baillie on 21st July 1964 and released into the Tropical House two weeks later. No breeding activity was observed until the summer of 1968 when a nest was found under a very thick layer of tropical creeper.

The nest was about two inches from the ground resting on a layer of dead leaves and grasses which we assumed had been collected by the breeding birds. The completed nest was quite large, I remember at the time being astonished at the nest size in relation to the size of the birds. The nest consisted of grass, feathers, thin shreds of banana leaves, which I feel must have been shredded by some of the larger birds in free flight and once discarded this was then collected by the Crimson-rumped Waxbills. Other materials used included hair, and stems of grass and millet.

Eggs were not seen, due to the fact that when the nest was found one of the birds was sitting and they continued to do so for 10 days, after which both birds were seen carrying food into the nest. Food was placed quite near to the nest area and consisted of soaked seeds, maggots dusted with Vionate, chopped mealworms and ants-eggs plus seeding and flowering grasses. I found that they also enjoyed fresh turves each day, also sprouted millet seed, barley, crushed hemp and dried flies. The crushed hemp was readily eaten, and the insects also, but not so ravenously, and it did not seem that insects were essential.

One young bird was seen being fed by one of the parents almost three weeks after the nest had been found. The parent birds at this stage were particularly timid and would not approach the nest while being watched. They were also very excitable, fanning their tails out wide and switching them from side to side, which was very attractive to watch. The young bird resembled the adults except that it had no eye stripe and the bill appeared brownish instead of black and had coloured nodules. It also had two tufts of downy feathers sticking straight up above the eye and no tail feather at all. The young bird was observed on numerous occasions after leaving the nest and at about three months old it became very difficult to distinguish it from the adults at a distance.

The Crimson-rumped Waxbills bred again in 1971, this time rearing two young ones. The nest was almost 10 ft. up on a wide wall overlooking the Mountain Gorilla enclosure and was built among very thick vegetation.

This year 1972 they again nested in the same area overlooking the Gorillas and reared two young. I was able to watch this nest through binoculars and worked out the incubation period at around 12 to 14 days, the young leaving the nest at 25 days old and returning to the nest each night for almost a week. Both sexes helped with nest building and it appeared that the male did most of the construction in the earlier stage. Almost all the larger pieces of nesting materials were found and carried to the nest site by the male. On three occasions I watched an adult male Red-billed Weaver (*Quelea quelea*) chase the male Crimson-rumped Waxbill while he was carrying nesting material, once actually taking a long stem of dried grass from his bill in flight and twice forcing him to land on the ground which resulted in the Waxbill dropping the grass; it was immediately picked up by the Red-billed Weaver who then flew to his small purse-shaped nest and started working on the large entrance at the side.

We never saw the male Waxbill feeding the female during incubation but once the eggs had hatched both sexes brooded and fed the young. Before feeding the young, the birds always settled on their customary perch and only after they had looked around and noticed nothing unusual did they fly to the nest. Once again it appeared that the male did more feeding than the female at least in the early stages. This may be because the female spent more time brooding and the male was responsible for

feeding the newly hatched chicks. Later, when the chicks were larger and did not need as much warmth, she then seemed to share the feeding almost equally as much as the male. One interesting point about the bird nesting was the considerable amount of crushed eggshell and cuttlefish eaten by the breeding pair both during incubation and in the rearing stages.

As described above, the Crimson-rumped or Sundevall's Waxbill (*Estrilda rhodopgys*) was bred at Chester Zoo in 1968, 1971 and 1972. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Assistant Editor.

* * *

OBSERVATIONS ON HATCHING NORTH AFRICAN GROUND HORNBILL AT THE SAN DIEGO WILD ANIMAL PARK

By JOHN R. FAIRFIELD

(San Diego Wild Animal Park, California, U.S.A.)

Africa hosts two species of large terrestrial hornbills, the North African or Abyssinian Ground Hornbill (*Bucorvus abyssinicus*), and the Southern species (*Bucorvus cafer*). Both species are black in colour with white primary feathers. The North African ground hornbill inhabits the savannah land south of the Sahara from Senegal and Sierra Leone in the west, across Africa through Niger, Chad, Sudan; and Ethiopia, Somali Republic, Uganda and central Kenya. The southern species is found living south of the Equator.

Both the northern and southern species have a huge black bill with patches of red at the base. The area of skin surrounding the eye is bare, blue in the northern species but red in the southern form. The wattle in the throat is inflatable, both red and blue in the male. The female is somewhat smaller in stature with the area around the eye and the wattle being completely blue. The casque on the head is most unusual in that it is open in front, and gives the appearance of being broken most of the time. The presence of the large casque is an excellent distinguishing feature of the North African form while it is hardly noticeable in the southern species. The diet of both species is varied to include lizards, snakes, large insects, small birds and mammals. Much of their lives is

spent on the ground foraging the vegetation for food. They are capable of flight and their roosting habits are in trees or low bushes in which they spend their nights.

At the time of this writing the San Diego Wild Animal Park has one pair of North African ground hornbills in the 125-acre East African exhibit. The female "Susie" was received at the San Diego Zoological Garden on 20th September 1961 from Tilburg, and the male "Charlie" was received at the Zoo on 8th August 1951 from Rotterdam. Both birds were thought to be adults on arrival. The female was received at the San Diego Wild Animal Park on 14th September 1970 and the male was received 24th February 1971. They were introduced to the same area and were immediately compatible. The individual temperaments of the birds are almost exactly opposite, with Charlie being a friendly and almost courageous bird while Susie is of a timid, shy and much reserved nature.

On 20th May 1972 Charlie was observed attempting to feed Susie a rodent. She accepted the mouse and consumed it after a brief period of carrying it around in her bill. At every observation for the next few days both Charlie and Susie were carrying leaves and twigs to a 18-inch diameter drainage pipe situated on the extreme eastern edge of the exhibit. The female Susie would place the material in the drainage pipe and appear to stand guard at the entrance. The week of 7th June 1972 was one of inclement weather at the Wild Animal Park. The drainage pipe which the hornbills had taken over was once again being used and Charlie and Susie left the area. The next day they were observed on the opposite side of the exhibit and on the moat line which was made of earth. They remained in this area almost constantly with the exception of Charlie who would migrate to the original food station across the exhibit and return to Susie with food.

On 12th June 1972 Charlie did not come for food. A visual examination of the moat line showed why. Both he and Susie were laboriously digging with their bills a cave in the earthen moat wall and a hole was started about 24 inches above ground level. Once the cave was large enough for them to enter they incorporated the use of their feet as well. Since it was obvious that neither he nor Susie were going to leave their labour for food a new feeding station and a new method of feeding was established. Their diet which consists of day-old chicks, rodents and small amounts of raw meat chunks was simply placed from afar near the nesting area. The construction of the cave went on daily until the morning of 23rd June 1972. Charlie was seen carrying leaves and twigs, and Susie was seen placing the material in the nest.

On 26th June 1972 mating was observed. It was witnessed only once at this time and took place about 200 ft. below the nest area. It was in typical avian fashion with very little vocalization. Charlie would emit low booming calls and walk around Susie with his wings partially extended and his feathers ruffled. He would thump his bill on the ground when

ooming. The complete act took about 30 minutes with the actual mounting being the terminating point.

On 29th June 1972 both birds were observed carrying nesting material into their cave, with Charlie spending more time inside than out. This behaviour continued until 12th July 1972 when Susie went inside the nest and remained. Charlie became more aggressive and protective of the entire area surrounding the cave.

The cave is about 4 to 4½ ft. in depth with a slight curvature to the left. The entrance hole is much smaller being about 18 in. in diameter. The cave opens east and is constructed so that no direct sunlight ever really enters more than a few inches into the entrance of the nest itself. The major area of the floor of the cave has been covered with leaves and twigs in which Susie sits facing the entrance. The earth that was removed during the actual cave construction has intermingled with rhino dung so that a ramp has been created from the ground level to the cave entrance.

On 16th July 1972 one off-white egg was observed partially exposed from under the feathers of Susie's breast. Since she sits facing the opening, the egg was rather easily seen. On 17th July 1972, a second egg was observed under Susie. The opening to the nest remained open and the male continued to feed the female. She did not leave the nest for food or water.

On 22nd August 1972 movement was observed in the nest and instead of the two eggs, we observed one chick and one off-white egg. The chick was hatched naked with eyes closed. The chick's bill is rather enormous for the body size, being very dark grey (almost black in colour) with a large egg-tooth in place on the tip. The dark pink skin (almost purple) covering the body of the chick was textured and closely resembled a layer of fine grey-white down when first observed. The size of the egg and the chick was close to that of the domestic turkey (*Meleagris gallapavo*). The second egg was fertile but was broken open by the female. On 24th August 1972 the second chick, almost full-term, was observed dead inside the nest.

The hatching of the North African Ground Hornbill at the San Diego Wild Animal Park is the second hatching of this rare species ever recorded in captivity, the first being in Bristol in 1971. This is the first hatching recorded in the Western Hemisphere.

* * *

BREEDING ROSS'S TOURACO

(Musophaga rossae)

By NEWTON R. STEEL (Stoke Fleming, S. Devon, England)

In October 1968 I was privileged to be the guest of the East African Guernsey Breeders' Association, during which time I not only judge cattle at the Nairobi Show, but word had got round that I was exceptionally interested in birds. Through this, all my hosts and hostesses on the ten different farms at which I stayed during this time, went out of their way to show me as much as possible of the bird and wild life of Kenya. It was whilst staying on a farm at Kitale that I visited a lady who had two pairs of Ross's Touraco—one of which that year had produced a youngster which died at some ten days old. I was so attracted by these birds that I tried hard to buy a pair from her, without success. However I was going to visit Mr. David Roberts at Lake Baringo so thought I might be able to obtain them there. There were in fact none available at the time but he agreed the price and promised to send me a young pair as soon as they had been hand-reared.

This was subsequently done and one day whilst engaged judging Dairy Herds competition in the Surrey area, I received a telegram to say that some birds were awaiting me at London Airport. The kind lady who was acting as my chauffeur for this judging engagement, offered to take me to London Airport to collect them, which we did on this June afternoon. They arrived each in its own separate compartment with feeding instructions pasted to the lid and when I got home and unpacked them, one—which subsequently turned out to be the male—was in excellent condition, the other looked somewhat dirty and tatty and gave me some concern for a week or two.

Mealworms were an irresistible temptation and with these in limited numbers, together with their softbill mixture and soft fruit and *ad lib* bathing facilities, they did extremely well in one of my calving boxes on the farm under infra-red lamps which were thermostatically controlled to maintain 65°F, then as the summer warmed up and they became better feathered, this was gradually reduced. They were given an outside flight which they could use in the daytime only, and here they remained until I moved to Devonshire in November 1967, where they were housed for their inside quarters in the cool end of a heated greenhouse, with an exit to a long 10 ft. flight raised 2 ft. off the ground on wire netting.

They seemed very contented and pleased with their new home which during the winter was thermostatically controlled to between 45°F and 50°F. They go into a moult in the early part of the spring each year and at the end of one of these moults, one June day in 1968, I returned from the garden to find the hen very severely beaten up about the head, and

own in a corner. So severely was she damaged that a scab grew right over her head and eyes, thus preventing her from seeing to feed and even today she still has a naked patch at the back of her neck and one blind eye, which she unfortunately did herself with one of her long claws when scratching the irritating scab. I had to force feed her for some ten days a fortnight and of course during this time she became very tame. Her head and eyes were dressed with ointment twice a day and in due course the scab came off and she re-grew her carmine crest. It was only then that I realised she was blind in one eye. During this period she was confined to a segregated section of the indoor aviary so that she should not fret and here she lived until the moult of 1971 when I thought it was really time that I tried to get them together again.

This I did in short periods of re-introduction when I was close by for an hour or two. One day to my delight I saw them feeding one another. I hurriedly spent a whole afternoon erecting a large tree log in the far end of the flight, up against a south facing wall, hoping that this might be a suitable home for them but no, they took no notice of it whatsoever. It preferred to carry very stupid pieces of stick on to some dangerously secure branches in the greenhouse. I endeavoured to help them by putting some flat, dry laurel branches and leaves horizontally, but for all their industrious stick carrying, everything fell down to the ground again. I then wove in a piece of wire netting upon which I thought they could put their sticks more securely, when one day to my horror I found a broken egg on the floor. It had rolled off this very insecure platform. This was 16th June 1971.

My next attempt was to commandeer the only suitable shopping basket and promptly remove the bottom of it, leaving a rim of about an inch all round. The bottoms of shopping baskets, as you may know, are more often convex than concave, so I had to make my nest-basket concave and this was done by pressing it into an earthenware pigeon nest pan, putting in the middle of it some extremely heavy bricks and filling the pan with boiling water. When it had cooled off I found the canes had set in a concave fashion and I then wired this on to the top of the wire-netting. A old green sunblind protects the nest from direct rays of the sun or infrared radiation from the glass. The nest is 6 ft. from the floor. Every time I approached the nesting-site to give any help at all, I was attacked by both birds so the only safe means was to keep them out in the flight while I performed the house building. This complete, I replaced the broken egg with a similar size bantam egg.

17th June 1971

They took to it and the following day a second egg was laid and then a third, so I removed the bantam's egg. This was the only occasion the clutch was more than two. Not having any idea how long they would brood, I left well alone, but on the 7th July one egg was missing. No

sign of it anywhere. I felt sure it had been eaten. After this they were less and less concerned, although they continued to sit for a day or two. I subsequently examined the second egg only to find it infertile so removed it.

25th July

Another egg appeared and a second one on the 27th.

27th July

These were again religiously incubated by the cock bird sitting from about 10 o'clock during the day and the hen bird from tea-time until the middle of the following morning. The eggs are almost completely round rather like those of an owl and 43 mm. \times 36 mm. with no small end.

They sat continuously for four weeks. When I removed the two eggs I found that one had a well-formed but decomposing chick in it. The head was well-formed and eyes visible, and there were black feathers down the neck and on the shoulders so it had obviously died just prior to hatching. With this I decided it was quite late enough, so removed the nest for the rest of the year. They went into their usual moult at the end of February. In March 1972 and at the end of March I replaced the basket nest.

9th and 11th April 1972

This time they were delighted to see and on the 9th April the first egg was laid, the second on the 11th April. They shared the incubation period again for nearly four weeks but again both eggs proved infertile.

19th May

Again they went to nest on the 19th May, this time not sitting quite so well as in the past, and after three weeks I tested the eggs and found them both infertile so I removed them.

28th and 30th June

Once again on the 28th June another egg appeared and a second on the 30th June. This time they sat well and on the 23rd July, just 24 days after, the second egg hatched and the little black chick, looking almost exactly like a young Moorhen, was sitting with its head up in the nest. But this was found dead on the floor at four days old. I removed the other egg which was infertile. This was a great disappointment. During this time I had been feeding them all their usual cut-up mixed food together with an insectivorous mixture and mealworms, but obviously this was not sufficient.

12th and 14th August, and 8th September

However to my delight they went to nest again, the first egg was laid on the 12th August and the second on the 14th August. The first

was hatched on the 8th September. I left the second egg in the nest for support.

During the incubation period I had started to feed the parents with an occasional sop of bread and milk. This they became very fond of and when the chick hatched, they had a regular feed out of my hand of bread and milk twice a day, ten or a dozen mealworms three times a day, and what I believe has been the main reason for success in rearing this chick, in place of water I substituted nectar feed. Other than their bath out of the flight, they have never been offered water up to the present time. They consume a cupfull of nectar a day, and the chick, now six weeks old, has been seen down at it. Mealworms were increased from 12-15 to 20-25 and they are now taking 100 a day. I have no doubt they would take more but I feel that these, with the bread and milk and nectar, would be adequate.

They have been consuming in the last two or three weeks the equivalent of half a slice of bread cut at an inch thick, soaked with milk overnight and sugar sprinkled on the top and, in addition to this, a very concentrated powder with a very high protein content. Half a teaspoonful of this has been sprinkled on both feeds of bread and milk, as well as on the mealworms. Gentles have been offered, but are not readily taken, except when fed before mealworms and if they are very clean and lively, then the old one seems to be eaten. Feeding is by regurgitation. Not as with pigeons where the young put their beaks into the parents, but by the young opening a large gape and its parent dribbling food into the open mouth. At least of the fruit and insectivorous mixture is taken. In fact for the last week or two hardly any, other than orange and grapes. Even pear did not seem to be appreciated.

At the time of writing on the 26th October, the chick has been out of the nest about for nearly a fortnight. It was interesting to note that at first the chick was found down on the floor, where it remained for four days despite my thinking it was kind to return it to the nest, but after four days it returned to the nest of its own accord and continued to be brooded there at night.

Since it came out of the nest, I have endeavoured to maintain a temperature of 60°F by means of an electric radiator. The chick is now well feathered and the blue sheen shows on the wings and tail, but as yet the very carmine of the secondaries is not visible. The bill and wattle and feet are still quite black. It will be interesting to see how long before they change colour. It is now about the size of a pigeon.

For those who have not been so fortunate as to know that they have a pair, the difference between the male and female is that in the male, the cere, or wattle, is very slightly concave and when really fit has a little red mark in the centre, whilst that of the female is convex (i.e. Roman-nosed) and has no red marking. One of the interesting features of the pair is that they very much resent any change in one's appearance.

Normally I never wear a hat or glasses when I am feeding them but should I inadvertently do so, I am attacked viciously. Apart from this they are most friendly, will take mealworms or bread and milk out of my hand, and always seem pleased to see me. I believe it is advisable, particularly during the hot summer, to let them have a bath available during incubation and should this be done, I think it is essential that it is there all the time so that each parent may bathe when it pleases, because on one occasion when I had withheld the bath for a period, both parents came off the nest and got thoroughly soaked and then sat in the sun drying themselves. As with so many birds, I find that they only bathe in fresh, clean water—in other words they will not go into a dirty bath.

The floor covering of the inside aviary is coarse sand, which I feel advisable as it is easily cleaned out, they being rather messy birds underneath their perch. For safety's sake I keep them off the earth. Visitors are something which I never let them have during the incubation period because they are much too agitated and omit their delightful liquid warbling cry. I do feel that it is inadvisable to encourage their nesting outside, especially in view of the length of time they sit and the lateness in the year for a chick to be out.

29th October

Glorious sunny day; father taught baby to have a bath. Incidentally three days ago he turned on the hen and scalped her unmercifully; she has been removed for treatment and is recovering. He maintains close watch over the chick which now feeds itself regularly.

As described above Ross's Touraco *Musophaga rossae* has been bred by Newton R. Steel. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate once with the Assistant Editor.

* * *

COLOUR PLATE FUND

Since its beginnings almost 80 years ago, our Magazine has been famous for its beautiful colour plates, depicting rare and interesting birds, either from paintings or photographs of live specimens.

We must keep up such a happy tradition and I urge all our members who can help to subscribe to our special fund for coloured illustrations.

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JEAN DELACOUR
President

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Wanted. Early and complete sets of Wildfowl Trust Annual Reports. Please write R. Smith 359 Aldridge Road, Birmingham B44 8BW.

NOTICES

Please note:

The address of the Hon. Secretary & Treasurer, to which all communications regarding Membership and subscriptions should be sent, is now changed to:
**20, Bourdon Street,
 London, W1X 9HX.**

Mail sent to Sladmore Farm, High Wycombe, will still be received for the time being but may be delayed in reaching this office.

In response to enquiries from American Members, we have established that the cost of sending the AVICULTURAL MAGAZINE to the United States by *airmail* is \$5.00 a year extra at the current rate of exchange. If you would like your Magazine sent to you by air, please write to me enclosing your remittance. We will be pleased to quote a price for airmail to other parts of the world, on request.

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THE AVICULTURAL SOCIETY

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THE AVICULTURAL MAGAZINE

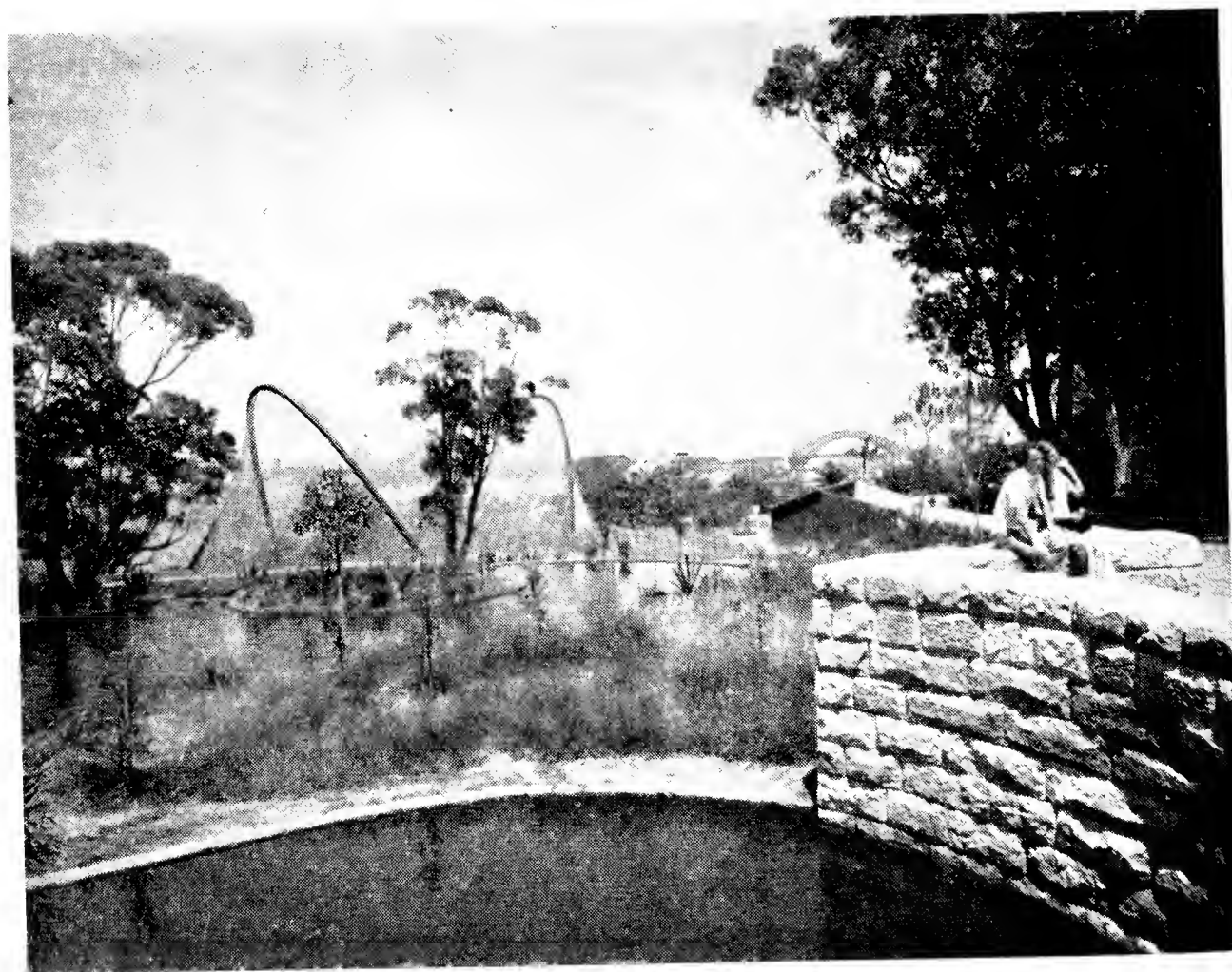
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View from Walkway Rain forest Aviary, Taronga Zoological Park, Australia



Copyright] Distant view of Rainforest Aviary over new waterfowl ponds [K. Muller

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MARCH-APRIL 1973

NEW WALKTHROUGH RAINFOREST AVIARY AT THE TARONGA ZOOLOGICAL PARK

By KERRY A. MULLER (Curator of Birds, Taronga Zoological Park,
Sydney, N.S.W., Australia)

The concept of large walkthrough aviaries is certainly not new in zoos, and the majority of first-class zoos in Europe and America have exhibited such aviaries for at least the last decade, some being constructed at the turn of the century.

The Colin Mackenzie Sanctuary in Healsville, Victoria, was the first Australian Zoo to build a large walkthrough aviary. This houses a breeding pair of Superb Lyrebirds. They have recently completed a second similar aviary and a large bird-of-prey aviary.

On 3rd February 1972 the New Walkthrough Rainforest Aviary was opened at the Taronga Zoo. In dimensions it stands 122 ft. long, 70 ft. wide and 60 ft. high, being oval in design.

Architecturally it is unique, the entire aviary being supported by two inclined steel parabolic arches. These arches are further supported by interlacing cables of 8 mm. diameter, stainless steel wire ropes and 12 mm. diameter high tensile stainless steel rods, strung to form a grid. Both the arches and cables are bolted into a concrete perimeter foundation. The aviary cover is of 25 mm. (1 in.) by 12 mm. ($\frac{1}{2}$ in.) galvanized weld-mesh, tightly secured to the cables and the cement foundation. This size mesh contains all bird species, including Malurus wrens, and prohibits the entry of pests such as sparrows, starlings and rats. A guiding principle in the design of the aviary was to create an enclosed space with acute angles, no crossbeams or upright supports, either inside or out. The entire space is available for unobstructed flight (in this we are fortunate in not having to consider problems of snow or ice loads.) Entry and exit for the public is permitted at either end by a revolving door, consisting of three panels set at 120° and permitting the access of rollers (or perambulators) into the aviary. The vertical edges of these panels are lined with heavy rubber strips to prevent escape of birds and injuries to the visitors.

Within the aviary visitors are confined to a wide natural wood walkway. Wherever possible this is raised above the ground, thus preventing visitors from leaving the walkway and allowing birds access under

the walkway from one area to another. The area under the walkway is heavily planted, and provides additional security and nesting areas for the birds. In areas where the walkway approaches ground an inconspicuous barrier of sharp upturned tree-roots has been provided, upon which vines and epiphytes are growing. This device has proved very satisfactory in confining visitors to the walkway and it has not been necessary, as in many zoos, to employ a keeper or guard on patrol during visiting hours. No visitors have yet been observed off the walkway.

Landscaping the aviary in a simulated rainforest was a major undertaking. The site has an undulating slope, in some areas exceeding 45° with a substrate of sandstone, in some areas forming attractive outcropping shelves. Initially all old soil, rubble and vegetation were removed from the site, retaining only an Umbrella Tree (*Brassaia*) and a badly cropped Paperbark (*Melaleuca*). New soil rich in leaf mould was added, in some areas contained by low stone retaining walls. Trees for perching were cut and set in concrete filled holes. To provide a composite rainforest effect similar to those found in eastern Australia, the following indigenous species were used in landscaping:—

For canopy and secondary cover: Tree Ferns (*Cyathea australis* and *Dicksonia antarctica*), Port Jackson Fig (*Ficus rubiginosa*), Cabbage Tree Palm (*Livistona australis*), Morton Bay Fig (*Ficus macrophylla*), Weeping Fig (*Ficus benjaminii*), Sydney Red Gum (*Angophora costata*), Grey Gum (*Eucalyptus punctata*), Bangalay Gum (*Eucalyptus botryoides*), Native Frangipanni (*Hymenosporum flavum*), Wattle (*Acacia longifolia*), Brush-berry (*Tristania conferta*), Christmas Bush (*Ceratopetalum gummiferum*), Lillypilly (*Acmena smithii*), Umbrella Tree (*Brassaia actinophylla*).

For ground cover: Harsh Ground Fern (*Hypolepis muelleri*), Rock Fern (*Pyrrosia rupestris*), Fishbone Fern (*Nephrolepis cordifolia*), Common Maidenhair Fern (*Adiantum aethiopicum*), Austral Bracken Fern (*Pteridium esculentum*), Coral Fern (*Gleichenia rupestris*), Hares Foot Fern (*Devallia* sp.), Rock Orchid (*Dendrobium speciosum* and *Liparis reflexa*), Creeping Fig (*Ficus pumila*), Native Grasses.

Several trips were made to rainforests to collect epiphytes and lianas. Epiphytes exhibited are:—Staghorn Fern (*Platycerium grande*), Elkhorn Fern (*Platycerium bifurcatum alcicorne*), Birds-nest-fern (*Asplenium nidus*), Climbing Fern (*Dictyria brownii*), And some native orchids. Transplanting of lianas was not successful, probably due to lack of sufficient shade cover. This will be attempted again when a canopy is established.

The majority of native trees were available from nurseries only in sizes up to 3 ft. in height. To gain additional initial plant cover, the following exotic "nurse" plants were added, many of which will be removed when cover increases: Giant Bird-of-Paradise (*Strelitzia nicolai*), Indian Giant Bamboo (*Bambusa arundinacea*), Large-leaved Privet (*Ligustrum lucidum*), Elephant Ear (*Colocasia antigurum*), Giant Honeysuckle (*Lonicera*

vildebrandiana), Cape Honeysuckle (*Tecoma capensis*), Asparagus Fern (*Asparagus sprengeri*), Wandering Jew (*Tradescantia fluminensis*), Begonias and Bromeliads.

A series of small pools and connected streams were established in the aviary, often adjacent to the walkway. Contours were shaped in the soil and lined with butyl rubber. Sand and river gravel were added to cover the rubber and give a natural appearance, and the pools planted with native lillies and rushes. Small fish, amphibians and tortoises were then added to complete the illusion of naturalness (much to the delight of our Kingfishers).

Water is a major necessity of any rainforest, and this is provided by four oscillating sprinklers located inconspicuously on the steel arches above the vegetation. On the ground a series of mist-producing heads are connected to a copper water line buried in the soil. To water the exhibit keeper need only turn on a series of valves and return to other duties. On hot days the overhead sprinklers are often turned on, to the mutual enjoyment of birds and visitors.

To prevent erosion and to provide a natural substrate, leafmould and dry leaves were used to cover the forest floor. These rapidly decomposed and provide food for insects and earthworms, which are in turn consumed by the birds, especially the Lyrebirds.

Food for the wide variety of birds is provided in several feeding stations, and changed once or twice daily. Stainless steel pans are placed in moveable holders, both at ground level and above ground dependent on the birds' feeding habits. These holders are fitted with circular transparent perspex plastic domes, placed 12 ins. above the pan. These keep all rain and water out of the feed but are unobtrusive in appearance. For nectar feeders several bottles are provided on holders in trees throughout the aviary. For fruit-eater birds several dead perches have a series of stainless steel headless nails imbedded in them, and pieces of apple, orange, banana and papaya are impaled on them daily and old fruit removed.

In stocking the new aviary, emphasis was placed on Australasian species inhabiting rainforest habitats. One reason for this is that the area of the zoo in which the aviary is built is dedicated to native fauna and flora. Another reason is that importation of any birds into Australia has been forbidden by law since 1948, and exotic bird species are difficult (or impossible) to obtain.

Labels were made identifying the birds presented, and defining the relationship and adaptations of different families of birds to particular ecological niches in a rainforest. It is our eventual aim to represent as many families as possible in the aviary.

The following species are presently exhibited in the rainforest aviary: Red-bellied Landrail (*Rallus philippensis*), Torres Strait Pigeon (*Ducula lorrrhoa*), Top-knot Pigeon (*Lopholaimus antarcticus*), White-headed Pigeon (*Columba norfolciensis*), Luzon Bleeding-heart Pigeon (*Gallicolumba*

luzonica), White-breasted Ground Dove (*Gallicolumba jobiensis*), Nicobar Pigeon, (*Caloenas nicobarica*), Victoria Crowned Pigeon (*Goura victoriae*), Sacred Kingfisher (*Halcyon sanctus*), Superb Lyrebird (*Menura superba*), Ground Thrush (*Zoothera dauma*), White-browed Scrub Wren (*Sericornis frontalis*), Yellow-throated Scrub Wren (*Sericornis lathami*), Superb Blue Wren (*Malurus cyaneus*), Willie Wagtail (*Rhipidura leucophrys*), Yellow Robin (*Eopsaltria australis*), Golden Whistler (*Pachycephala pectoralis*), Grey Shrike Thrush (*Colluricincla harmonica*), Eastern Whipbird (*Psophodes olivaceus*), Eastern Silvereye (*Zosterops lateralis*), Yellow-faced Honeyeater (*Meliphaga chrysops*), Yellow-tufted Honeyeater (*Meliphaga melanops*), Lewin Honeyeater (*Meliphaga lewini*), White-naped Honeyeater (*Melithreptus lunatus*), Eastern Spinebill (*Acanthorhynchus tenuirostris*), White-cheeked Honeyeater (*Phylidonyris niger*), Bell-miner (*Manorina melanophrys*), Noisy Friar-bird (*Philemon corniculatus*), Olive-backed Oriole (*Oriolus sagittatus*), Southern Figbird (*Sphecotheres vielloti*), Regent Bowerbird (*Sericulus chrysocephalus*), Satin Bowerbird (*Ptilonorhynchus violaceus*), Green Catbird (*Ailuroedus crassirostris*), Siamese Fireback Pheasant (*Lophura diardi*).

Several of these have nested successfully in the first year of operation. The Satin Bowerbird has a fine bower within three feet of the public walkway. Efforts were made to avoid initial overstocking, allowing for later plant growth to provide additional cover. Within the next few months pittas, treecreepers, sunbirds, log-runners, cuckoos, parrot-finches and small lorikeets will be added to the aviary.

One of the greatest of all aviculturists and ornithologists, Jean Delacour, once wrote "The principle of a walk-in cage is excellent, and I can claim to be the sponsor of such aviaries in America, where they have proved highly satisfactory. But its very principle is that the cage itself is not obvious, so that the visitor who is inside has as much as possible the illusion of walking among free birds. The frame of the aviary must not only be simple and inconspicuous, but also made invisible by trees and creepers. Even its approach should be so planted on the outside that one is not aware that there is a cage at all."

We feel that in design and landscaping our new rainforest aviary meets these criteria admirably.

REFERENCE

- DELACOUR, DR. J. 1961. Cage and Aviary Design. *Avicult. Mag.*, Vol. 1, No. 3, p. 107.

* * *

BRIEF NOTES ON DISPLAY AND POSTURES OF SOME LARGER FRUIT PIGEONS IN CAPTIVITY

By C. J. O. HARRISON (Berkhamsted, Herts., England)

On two recent visits to the London Zoo on mild, dull December days I was surprised at the activity of some of the fruit pigeons. This included a display apparently not described previously, and I have therefore published these notes. The accompanying sketches are reconstructions of a later date based on hasty scrawls on the backs of envelopes or any paper that came to hand in my pockets. They are not accurate as regards detail but may help to give a general impression of the postures.

The display was that of the Grey-necked Fruit Pigeon, *Ducula caroli*. There were two birds, which Derek Goodwin tells me are two males, about the size of domestic pigeons but more stoutly built in typical fruit pigeon fashion. They are mainly grey with dark spots on the wings and greenish tail. The upper breast is pale silvery-grey and the lower breast a darker shade of grey, the two separated by a transverse line and giving an illusion of shadow on a sunlit bird. Towards the sides of the breast a white line separating the two areas is visible. The belly and under tail coverts are a dark purplish-brown.

The displaying bird drew itself upright on the perch, very tall and thin, and blew out its chest as a two-tone grey balloon, rather in the fashion of a pouter pigeon. At the same time it extended its neck forward and bowed the head until the neck rested on top of the inflated breast with the head pressed down against the upper breast and the bill pressed into the feathers (fig. 1). The legs were stretched and the tail pointed downwards.

In this posture it uttered a series of low-pitched "oomp" notes, about seven notes in rapid succession, beginning emphatically and becoming more rapid and lower in pitch, and dying away. I can only describe the general tone as similar to that heard when air rapidly bubbles out of a submerged pint milk-bottle—a sound most washers-up may recall. The bird repeated the performance twice.

It then turned slightly towards its companion who stood in an upright, alert posture nearly. The displaying bird retained its very rigid upright stance with lowered head, but by flexing its legs slightly performed a series of vigorous upward jerks, very like those occurring in the display of some estrildines. Having done six or seven of these it relaxed a little, raising its head and uttering a small harsh note; after which it returned to its more normal posture. The very upright posture was of interest because this species is one with a conspicuously patterned underside.



FIG. 1

On the same visits I watched a Mountain Imperial Pigeon, *Ducula badiata*, perform calling and nest-calling in a nearby aviary. The commencement of this was indicated by the bird extending head and neck forwards and upwards with the feathers of the head slightly fluffed and the throat partly inflated (fig. 2). This was followed by an arching forwards and downward of head and neck accompanied by a puffing-out of the breast, resulting in a hunched posture with the head pressed against the front of a swollen breast and the bill almost buried in the feathers (fig. 3). In this posture

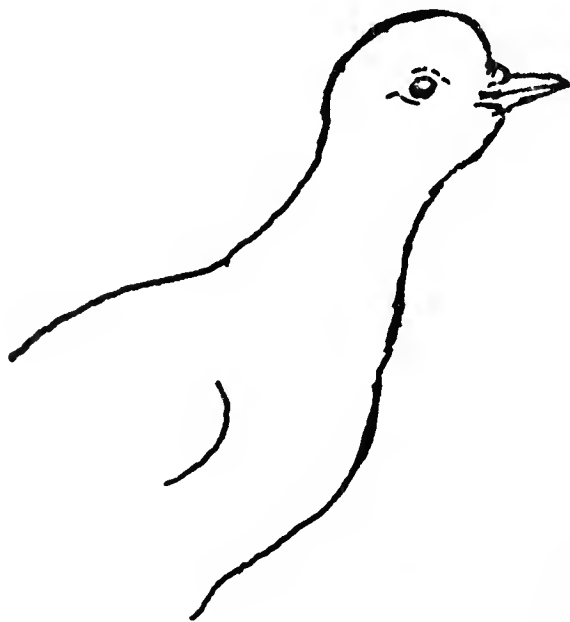


FIG. 2

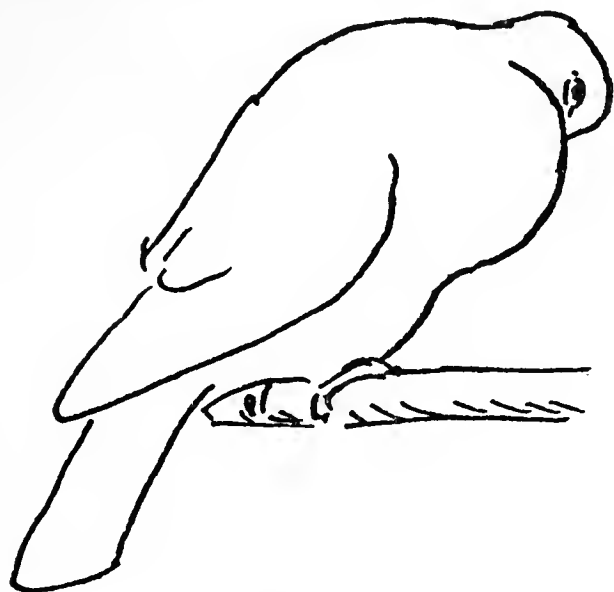


FIG. 3

he bird uttered four well-spaced, deep notes, the first two rather short and more rapid, the second pair longer and almost disyllabic "wook-wook, urwook, urwook". This was immediately followed by an abrupt upward swing of the head back to a more normal position above the back terminating in a slight backward pressing of the head and outward thrust of the breast. The same pattern was witnessed several times.

This individual was also seen nest-calling on two different occasions. It squatted on top of a closely-clipped privet hedge. Its tail was not noticeably raised and there was no marked wing-twitching, only an occasionally slight tremor of the wings. Small twigs were picked up and placed to either side by the bird. Periodically it would call. There was the same arching of the neck and pressing of the deeply-lowered head against the inflated breast. The call was only two monosyllabic notes "wook, wook" and then the head was abruptly raised again in typical fashion.

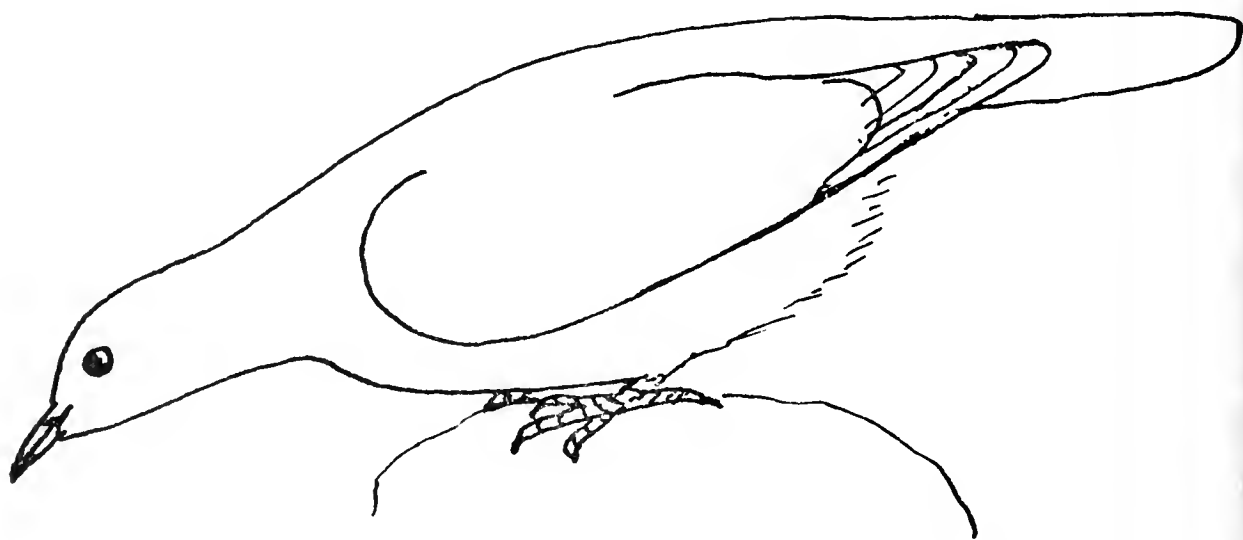
I had also seen this type of call with deeply-lowered head from an Australian Pied Imperial Pigeon, *Ducula spilorrhoa*, at Amsterdam Zoo in 1970. In this case the posture of the calling bird was almost horizontal. The bird squatted on a perch, lowered its head to the front of the breast with bill pressed against the feathers. It uttered what I noted at the time as a deep, hollow "crool, coo-rool". It also gave a briefer "kut-crool" note.

In this last species I noted one individual standing on a possible nest-site, tilted forwards with tail straight up and breast and bill almost touching the site. Its wings were rhythmically quivering but I could not hear a call at the time. I also noted one bird threatening another by moving in short hops towards it with head low and neck extended forwards, and uttering an abrupt "check" or "chuck" note, loud and nasal, and more like that of a rail than a pigeon. This last note appears similar to that recorded by Derek Goodwin (*Pigeons and Doves of the world*, 1967; p. 420) for the Indonesian Pied Imperial Pigeon, *D. bicolor*.

MATING CEREMONY OF THE MOUNTAIN IMPERIAL PIGEON

By DEREK GOODWIN (London, England)

On January 3 1973, I observed copulation in a pair of Mountain Imperial Pigeons, *Ducula badia*, at the London Zoo. Although this was seen only once it seems worth publishing here, partly so that it can form an appendage to Dr. Harrison's observations on *Ducula* species, and partly because I know of no other observation on any species of the *Ducula/Ptilinopus* group. The copulation ceremonials of pigeon species although sometimes variable in minor details, are usually species-specific (Goodwin 1956, 1970) so that even if only one such has been seen it is highly likely to fall within the species' normal repertoire and quite likely to be entirely typical.

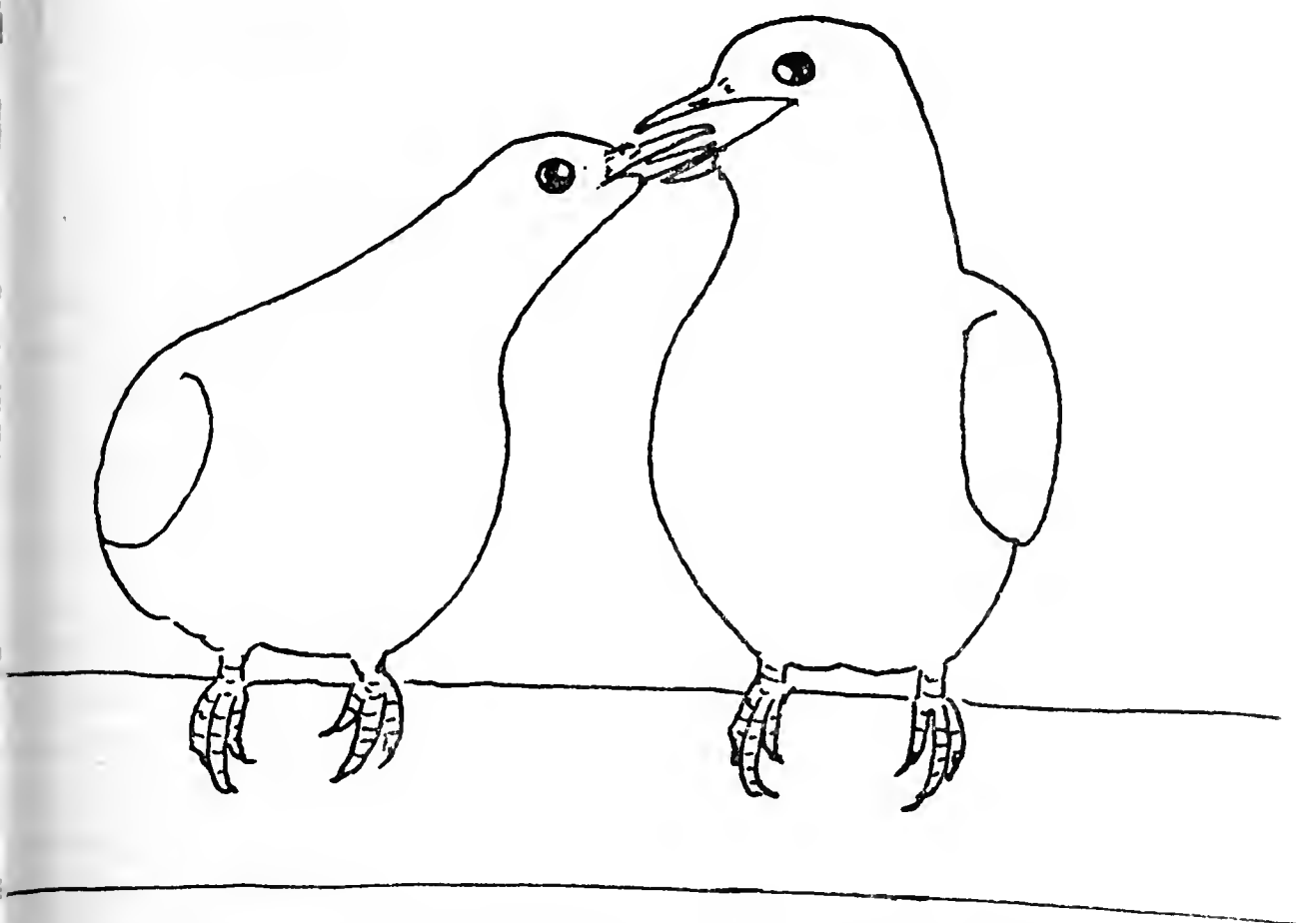


Mountain Imperial Pigeon. Female soliciting.

Shortly after cooing (see Harrison preceding article pp. 39-41) the male flew down, slighted on a low perch and at once displacement-preened at the side of his breast. The female, on seeing this, immediately flew down also and alighted about two feet from him. As she did so he displacement-preened once behind his wing. She sidled a little towards him, then adopted a soliciting posture which differed from that of other pigeons known to me in that her neck was elongated and curved slightly downwards. For some moments the male stood beside her in an indecisive manner. Then he raised his head, slightly swelled out his neck (inflation or plumage erection?), then mounted the female. He remained for some time, perhaps only half a minute but it seemed longer, quiescent on her back. Once during this period he head flicked, usually a gesture of irritation or repulsion (Goodwin 1956 b). Then he began simultaneously to coo and

to manoeuvre backwards to copulate. I had the impression that the actual cloacal contact coincided with the end of the cooing phrase, and the backward movement of the head as described by Harrison.

The male dismounted onto the perch at the same side of the female from which he had previously mounted. He lifted his head high, the female turned eagerly towards him and reached up with her bill. The male offered his bill, opening his gape widely. The female inserted her bill and with it inside the male's rapidly opened and shut her bill with a vibrating movement of the head. The male did the same (except that his bill was, perforce, widely open at the time) with his bill. There was no passage of food or other matter between them. They separated, then immediately repeated this billing, after which the mating ceremony appeared to be at an end.



Mountain Imperial Pigeon. Post-copulatory billing.

If this instance was typical its most noticeable difference from that of other pigeons whose mating ceremonies have been described was the occurrence of billing after instead of before copulation. The rapid opening and shutting of the mandibles is similar to what I have seen from the African Green Pigeon, *Treron calva*, and the Green Imperial Pigeon, *Ptilinopus aenea*, on the nest site and which is possibly their equivalent of the 'dipping' of *Columba* species. Cooing while on the female's back occurs in the copulation ceremonial of the Diamond Dove and some of the Australasian bronzewings (Goodwin 1960).

I hope these brief notes of Colin Harrison and myself will stimulate more detailed observations by the many aviculturists who have bred fruit pigeons, or any other species whose behaviour has not been recorded.

The accompanying sketches are intended merely to give an idea of the postures described. They have no pretensions to art or detailed accuracy.

REFERENCES

- GOODWIN, D. 1956 a. Observations on the voice and some displays of certain pigeons. *Avicult. Mag.*, 62 : 17-33 and 62-70.
 GOODWIN, D. 1956 b. The significance of some behaviour patterns of pigeons. *Bird Study* 3 : 25-37.
 GOODWIN, D. 1960. Some observations on the Diamond Dove. *Avicult. Mag.* 66 : 97-105.

* * *

OBSERVING THE HABITS OF FOREIGN DOVES IN CAPTIVITY

By PROFESSOR CARL NAETHER (Encino, California, U.S.A.)

What has interested, indeed fascinated, me more than any other factor in enjoying foreign doves and pigeons in captivity is their individual habits as manifested in their day-to-day behaviour, particularly in relation to the habits of domestic doves and pigeons. In this essay I plan to emphasize distinctive behavior traits of species of foreign doves and pigeons which it has been my good fortune to maintain over extended periods of time in my aviary.

In appraising the value of my observations, the reader should remember that no two doves or pigeons, even those belonging to the same species, behave necessarily in the same manner. This behavior may be conditioned by many factors, over most of which their keeper has little or no control. They may include the following: whether or not the doves were raised in their native haunts or in captivity; how long they have been in captivity and how well they have adjusted to its limitations; whether they are kept under highly artificial or more or less natural conditions, and, of course, how carefully and humanely they are treated by their keeper. All these considerations, and many others, affect their behavior in captivity very much.

One of the most typical doves for study, not only from the standpoint of behavior but also from that of appearance is the Galapagos Dove. It made its first appearance in captivity in 1893 when four specimens arrived at the London, England, Zoo, and in 1923 at the New York Zoo. This small, short, plump bird looks neither like a dove nor pigeon, and is in this respect unique among foreign doves. I well remember the first pair I acquired quite some years ago. Almost the very moment I released

male and female into a planted aviary, containing a mixed lot of doves and softbills, they made themselves completely at home. At once they began to investigate the aviary from corner to corner, the feed dishes and the nestboxes, without in any way disturbing the other inmates of the aviary. Best of all, they were wholly unafraid of me, acting as if simply belonged with them in the aviary. Their curiosity next centered on the aviary soil, which soon they punctured vigorously with their fairly long, curved beaks, apparently searching for beetles and grubs in the numerous holes they dug all over the aviary floor. This habit of probing the soil for nourishment is a distinct behavior trait of the Galapagos Dove, one I have not observed in any of the other species of foreign doves I have kept. Moreover, my pair lost no time in locating an open-front nestbox, soon thereafter building a flimsy nest with sticks and straws, and in due course raising young successfully. During their sojourn in my aviary, these unusual "undovelike" doves proved tame and trusting, wholly unafraid of me, and attending to their affairs without in any way bothering their neighbors.

The most notable behavior trait of the Snow Pigeons I once kept was their delightful liveliness: their flying and chasing about in the aviary, time and time again jumping in and out of the large, open-top nesting box, while voicing their "clucks and croaks" in a very determined effort to coax a suitable mate to join them. Filled with overflowing energy, these handsome pigeons were "on the go and fly" seemingly the whole day long, and in this behavior strongly suggested that of certain varieties of domestic pigeons. So deeply absorbed were they in their goings and comings as to pay virtually no attention to me when I entered their private abode to feed and water them. That they were closely related to domestic columbae was shown by their eagerness to mate with blue grasser Pigeons, there being no female Snow Pigeons available.

Among the gentlest "wild" pigeons I have ever had in my aviary was a trio of freshly imported Splendid Pigeons—two hens and one cock. This quite handsome threesome lived peacefully together during all the years they were in my possession. Even after mating and producing some spring, old and young flourished without showing the slightest tendency toward disagreement. On the basis of this rather unpigeonlike behavior of freshly imported birds, I assumed that this species lived and nested in the wild in its native habitat, as is the custom of certain wild species of pigeons.

A lovely pair of Bartailed Cuckoo Doves deserve mention also owing to their almost astounding prolificness during the four years they have been in my aviary. Always using the same nesting site in the half-dark of their private aviary, they have invariably brooded the single white egg faithfully, hatched it in 13 days, and nursed the squab to vigorous maturity. Their inactivity when brooding amuses me, since it manifests itself only in the raising of the head over the nest's edge as if to say, "please, don't come

closer, just leave me to my private business!" These beautiful long tailed birds' behavior is characterized by seemingly day-long masterly inactivity, spent on the same high perch or else on the nest. Perhaps that is the main reason why in antique records they were considered being so-called "tree pigeons". Even though for the last two seasons their eggs have lacked fertility, the pair continues to lay them month in and month out, even during the winter months—truly an interesting couple!

And now a few words concerning a pair of Key West Quail Doves, which have graced a part of my aviary for the last seven years, raising many youngsters, but currently laying only infertile eggs. Their characteristic behavior trait lies in their sitting on the nest close together side by side not only at the time of "changing the guards," but literally for hours on end as if both male and female were determined to see the eggs hatch. Since they do not, or cannot, "sense" the infertility of their eggs, they usually continue to brood for 12-13 days. And though I have followed the well-meant advice of a friendly, concerned veterinary, giving them epsom salts, special vitamins, and what not, I am unable to effect a "cure," probably because the doves are too old to reproduce, so I just have to let them sit side by side and "enjoy" themselves! They are among my pensioners that have served me well in bygone years, therefore deserving of rest and quiet.

In conclusion, a brief mention of a pair of Bartlett Bleeding Heart doves which have been my possession for well over a year. Their behavior during all these months is marked by almost constant restlessness and shyness, which no doubt is responsible for their reluctance to nest. They live in a private compartment, wholly undisturbed by other doves and thoroughly well protected against outside enemies. Though I keep my distance when feeding them, they at once begin to run about wildly, certainly sore afraid of me. Such reactions are new to me, especially when they signify no change for the better in more than twelve months. My explanation of this undesirable behavior is that somehow or other they were not accorded the proper treatment by their former owner. However, they are a beautiful pair, not at all common in this country; so I shall continue to care for them hoping against hope that they will in due time change their behavior and "reform."

* * *

THE HATCHING OF AN OSTRICH CHICK AT THE TROPICAL BIRD GARDENS, RODE, BATH, IN 1972

By D. H. S. RISDON (Rode, Somerset, England)

A pair of Ostriches at Longleat Safari Park laid a number of eggs and Mr. Roger Cawley, the Manager, kindly asked us if we would like to try our hand at hatching them, so they were placed in an incubator. Altogether six eggs were sent to us over a period of several weeks. Three proved to be infertile two developed chicks which failed to hatch, the remaining one did hatch and the chick survived for three weeks, eventually dying of Aspergillosis.

Details are as follows:

The temperature of the incubator was kept at 98°F for five weeks and 100°F for the last week. The eggs themselves were laid on moist sand and turned every morning and evening. Examination over a strong light showed that at 41 days the chick had penetrated the air sac within the egg; at 42 days it was tapping the shell; on the 43rd day the chick hatched with some assistance from our keeper, Martin Greene, who made a small hole in the shell at the end containing the air sac to enable the chick to breathe. This it could be heard doing quite clearly.

Hatching occurred on the 8th July 1972. For the first three days the chick did little. It neither ate nor drank and was very weak on its legs. At the end of this time it began to walk properly and was transferred to a pen indoors over which was suspended an infra red lamp. It then began to peck at clover and chopped grass. On the 11th July it took half grown crickets and was seen to drink for the first time. On the 14th July it was seen to take grit in the form of a mixture of flint, oyster shell and limestone. On the 15th July it was put out on short grass during sunny periods and began to eat turkey pellets. On the 16th July it was grazing and eating pellets well.

From this time onwards it began to grow and seemed to be doing well, but on the 29th July it died. It was of course shut in at night and at all times had access to the infra red lamp during dull sunless periods in the daytime.

It should also be recorded that Woburn and Windsor Safari Parks kindly sent us eggs laid by their Ostriches, but unfortunately all were infertile.

* * *

BREEDING OF THE VICTORIA CROWNED PIGEON *GOURA VICTORIA* AT BRISTOL ZOO

MICHAEL SHERBORNE (Overseer of Birds, Zoological Gardens, Bristol, England)

During 1972 a Victoria Crowned Pigeon (*Goura victoria*) was hatched and reared at Bristol Zoo, which we believe is the first breeding of this species in Britain.

The cock bird has been in the collection since 1968 and a hen was acquired in February 1971. They have been part of a mixed collection in the walk-through tropical bird house since October 1971. Other species exhibited here include Rothschild's Mynahs, Nicobar Pigeons, Woodpeckers, Plovers, Broadbills, Hanging Parrots, Hoopoes and small insectivorous species.

Mating began in the middle of December and a few days later the birds started building a nest in an artificial tree in the centre of the public walking area. The nest was typical of pigeons, an untidy heap of sticks about 18 inches across and it was 14 feet above ground level. The first egg was laid on 11th March from a branch outside the nest and it broke on the floor below. Another was laid on 6th May but there was no sign of hatching after the incubation period of 28 days. We left it for a few days longer but it was stolen before we could check if it had been fertile. A third egg was laid during June and was removed, addled, after ten days incubation time. The fourth egg, laid in August hatched on 11th September.

The parent's food consisted of insectile mixture with chopped fruit, corn, maize, wheat and turkey breeders' pellets. They also had free access to livefood (maggots and mealworms). Both fed the chick until it left the nest on 11th October and for several weeks afterwards. It feathered quite quickly and for a few days before it left the nest it would stand on the edge flapping its wings, looking an exact miniature replica of the parents except for the less well-developed crest. In about 10 weeks it was as large as the parents. The only visual difference in the sexes appeared to be in size and as far as we can ascertain the youngster is a hen.

As described above the Victoria Crowned Pigeon (*Goura victoria*) has been bred at Bristol Zoo. It is believed this is a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Ireland is requested to communicate at once with the Assistant Editor.

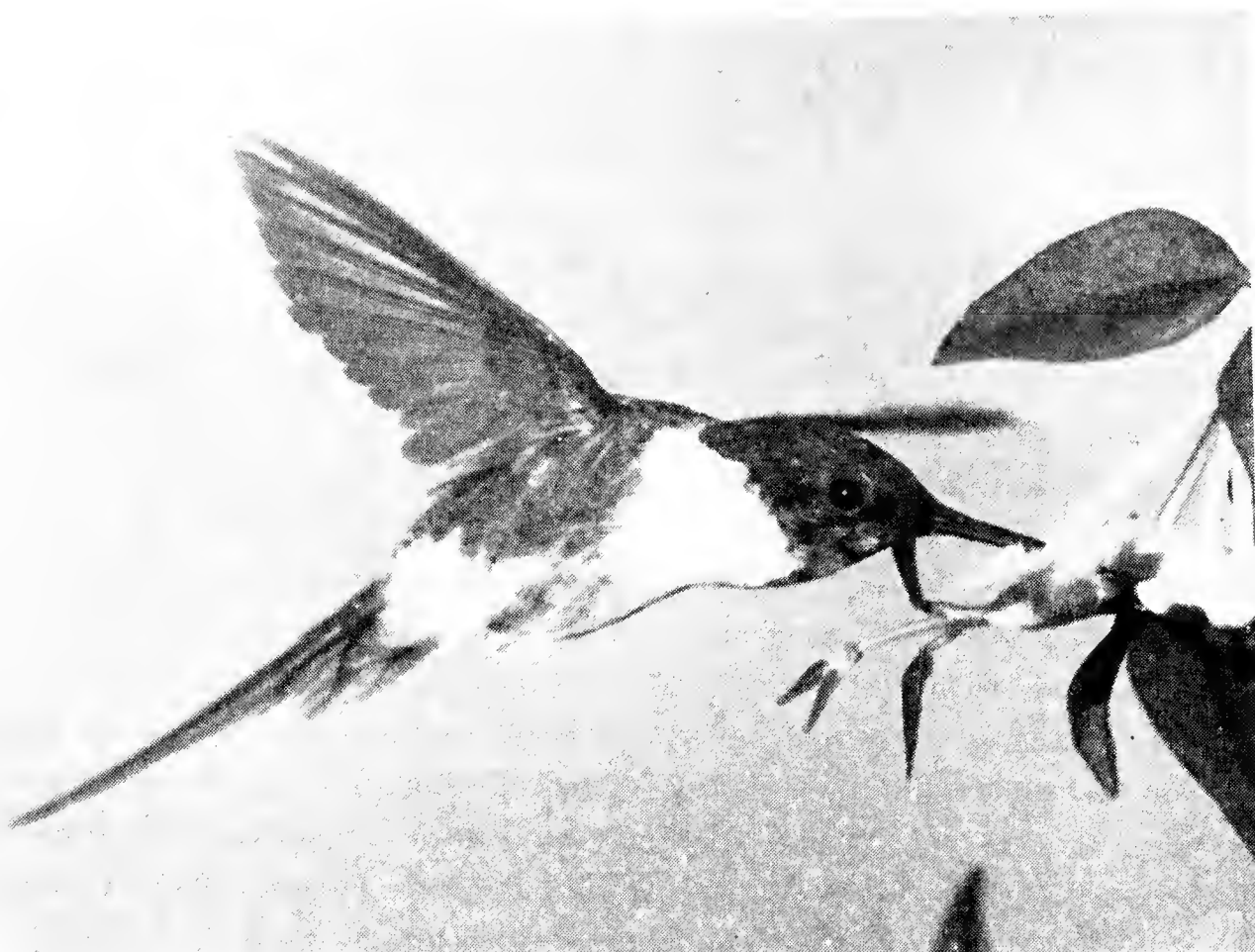
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Victoria Crowned Pigeon with young, a few days after it left the nest

[J. Buck



Horned Sungem Hummingbird male in immature plumage



Copyright]

Horned Sungem Hummingbird male in adult plumage

[A. J. Mobbs

THE HORNED SUNGEM HUMMINGBIRD

By A. J. MOBBS (Walsall, Staffordshire, England)

The Horned Sungem, *Heliactin cornuta*, is found in central and eastern Brazil. The species is rarely seen in captivity, indeed at the time of writing, I believe the male in my collection to be the only one in this country and probably in Europe. P. H. Hastings brought a number of these birds in during the summer of 1957 and has, I believe, imported only the occasional one or two since then (Hastings, 1969). M. W. Clifford imported two males during the spring of 1971.

One of the males imported by Clifford went to a collection in the north of England; it was an adult. This bird died during the latter part of 1971 due to a number of abscesses forming in and around the bill. The other male, which was immature, I purchased.

Adult males are approximately $4\frac{1}{4}$ in. overall length. As $1\frac{3}{4}$ in. is taken up with the tail feathers and a further $\frac{1}{2}$ in. by the bill, it can be seen that the Sungem is one of the smallest of the Trochilidae if the bodysize only is taken into account. I have read that if the tail were taken away, *cornuta* could be compared to the smallest of birds, the Bee Hummingbird, *Calypte helenae* (Greenewalt, 1960). Not having seen a live specimen of the latter, I am not in a position to argue. I would point out, however, that the Reddish Hermit, *Phaethornis ruber*, is certainly smaller bodywise than the Sungem.

The adult male Horned Sungem has upper parts of shining greenish blue which reflect a coppery sheen in certain lights. Sides of head are velvety black which is carried on to the throat and terminates in two points on the upper breast. Occasionally these feathers (hereafter referred to as the beard) merge into a single point. The sides of the neck and upper breast are pure white, these feathers forming a ruff thus highlighting the velvety black beard. Lower breast and belly are also white, but as these feathers are not so dense as those which form the ruff, they do not have the intense whiteness of the latter. The crown is iridescent dark blue, at the sides of which are iridescent tufts (hereafter referred to as horns), which are glittering golden green turning to iridescent ruby red at the base. In certain lights these horns appear blue except for the base which always appears as ruby red. The tail feathers are narrow, pointed and much graduated. The central pair being shining green and the remainder white with the outer edge green. At no time is the tail held in a forked position; I mention this having seen illustrations depicting the species with a forked tail.

Females are very much like the males, but lack the glittering feathers of the crown and the black beard. Also the outer tail feathers have a black oblique band near the base.

As already mentioned, the male I have in my collection was in immature plumage at the time of purchase. It was very much like a female in appearance except for a thin line of glittering blue feathers along the centre of the crown and a few black feathers on the upper throat. The blue feathers are erectile in the adult; in the immature bird they were small and insignificant. Like the female, the immature male had an oblique black band near the base of the outer tail feathers. The two central feathers were shining dark green, but in the immature bird they were broader and not so long as in the adult.

I purchased the Sungem on 21st May 1971. Other than being somewhat fatigued after the long journey from Brazil, the bird was in excellent health and the following morning, after a good night's rest, was in excellent spirits. In fact as soon as the birdroom lights were turned on, the bird commenced to sing most exuberantly.

I believe this bird may have been moulting at the time of purchase, but it was not until 23rd June, that I noticed feathers being shed in any number and then it was breast feathers only which were found in the bird's cage. It was another month before any flight feathers were shed. Shortly after this, the bird commenced to moult in earnest and each week a little more of the black beard appeared. Half the flight-feathers had been renewed before any tail feathers were shed. The black and white outer feathers were the first to go and it was 27th November, before the two central green feathers were dropped.

The iridescent feathers on the crown and the horns are of course the outstanding feature of this species and as there was no sign of these coming through until the beginning of November, I had by then begun to despair of ever seeing my bird with horns. However, on the same day as the central tail feathers were dropped, I wrote in my diary "The horns are at last showing on the Sungem!".

As can be seen, the moult from immature to adult plumage was an exceptionally slow process, especially for a hummingbird and it was not until 14th January 1972, before it was finally completed. Exactly 34 weeks.

Perhaps I should point out that although this was an exceptionally slow moult, the bird was in excellent health throughout and when it eventually attained adult plumage, it was feather perfect. It will now prove interesting to see how long it takes the Sungem to complete a normal annual moult.

I have found the Horned Sungem to be one of the most robust of the smaller hummingbirds; it is also one of the most vocal. It is rare indeed for me to enter the birdroom and not hear this bird singing, in fact from first light until approximately 7 p.m., it is rarely silent. The song consists of an oft repeated chittering note terminated with a loud chirring note which is repeated three or four times. This song is sung both in flight and when the bird is at rest. In both cases it is uttered almost continuously with a break of only a second or two in between each phrase.

As well as the song, the Sungem will on occasions utter a loud "twitting" note. This is heard especially when the bird is inspecting a strange object, or when alarmed. Perhaps I should add that this note seems to be used only when the bird is on the wing.

As with most of my tiny hummers, the Sungem is housed in a cage on its own. The cage front is 1 in. by $\frac{1}{2}$ in. welded mesh, painted black. There are two doors cut into the mesh, each 7 in. by 6 in. To prevent injury to my hands and to the bird, black adhesive tape surrounds each opening. I mention this because the Sungem often displays to this tape. It will also on occasions display to one of the perches in its cage. When displaying to the tape, the bird moves from side to side on rapidly beating wings, uttering the chittering notes used in the normal type song. The bird often hovers in front of the tape, touching it with the tip of its bill, after which the body is moved up and down and from side to side very rapidly. When the bird directs its display at the perch, it is very much the same as when directed at the tape, except that the bird moves from side to side in an arch instead of in an almost straight line. As well as performing the rapid movements already mentioned, the bird will occasionally hover directly above the perch, touching it with its bill and extended beard feathers, after which the bird alights and goes through the actions of mating. Throughout the display procedure the beard is extended, but at no time have I seen the horns spread. This is rather surprising as I should have thought these feathers would be used during display even more so than the black beard.

The iridescent head feathers and the horns can be erected slightly; many hummingbird species are able to erect their head feathers, however, this is not at all uncommon. When the Sungem preens its wing butts or scratches its head, the horns do appear to be fanned slightly. Whether the bird can do this at will or during certain preening postures only, I am unable to determine.

At the time of purchase, I fed the Sungem a mixture of Super Hydramin and sugar. After a week on this mixture, I persuaded the bird to take the diet I usually feed hummingbirds, namely equal parts Stimulite nectar and clear honey. I would not call this bird highly insectivorous, however, it does take around fifteen to twenty fruit-flies each day. These flies are taken from either the sides of the cage or from the wire mesh front. The bird takes hold of a fly with the tip of its bill, tosses the fly into the air and catches it with gaping bill, then swallows it all in one movement. At no time have I observed the Sungem hawking flies. I have noticed the bird prefers the smaller fruit-flies, large ones being strictly alone. If the Sungem accidentally drops a fly it has caught, it will pick it from the floor of the cage, toss it in the air and then swallow it. The Sungem prefers a shallow saucer of water in which to bathe and has at least one bath each day. Compared to many hummingbird species, this bird is not what I would call over-fond of water. It dislikes

being sprayed and because of this, I subject it to one a week only, prior cleaning its cage.

Claw trimming is an exacting chore which has to be carried out periodically. As the Sungem has the smallest legs and feet of any species I have yet encountered, the task has proved even more harrowing than usual. Unlike the Reddish Hermit (Mobbs, 1971), the bill of the Sungem does not require trimming. It did become overgrown a few months after purchase, but the overgrown portion sloughed off of its own accord.

There is a belief that if birds are supplied with perches of a different thickness, the need for claw trimming is eliminated. This is not the case with hummingbirds and these birds should always be supplied with perches which they can grip with ease, otherwise their claws will eventually become deformed. I might add, it is extremely cruel to allow the claws of a hummingbird to become overgrown, as these birds use their claws in preening areas which cannot be reached with the bill.

REFERENCES

- GREENEWALT, C. H. 1960. *Hummingbirds*. New York : Doubleday.
HASTINGS, P. H. 1969. Difficult Hummingbirds. *Foreign Birds*, 35 : 225-22.
MOBBS, A. J. 1971. Notes on the Reddish Hermit Hummingbird. *Avicultural Mag.*, 77 : 160-163.

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REPORT ON THE TROPICAL BIRD GARDENS RODE, 1972

By D. H. S. RISDON (Rode, Somerset, England)

This has been an average year for breeding results with no spectacular successes. The nearest was the attempted breeding of our pair of Casqued Hornbills. In 1971 the cock partially walled up a hole in a barrel put up for them but never got any further. This year he actually walled the hen in but after about a week she broke out again and no further interest was taken in the barrel. It is difficult to be certain but, in addition to mud, the cock appeared to use regurgitated food as "plaster". This mixture hardened off to the consistency of baked clay and one wonders whether saliva from the bird's crop had something to do with it.

In the autumn of 1971 a young White Stork was brought into us by the RSPCA which had fallen down a chimney and was covered in soot. The bird carried an aluminium ring and turned out to be one of the three siblings which had left the nest in Jutland some weeks earlier. It seemed strange that they should have drifted so far west as they were all seen in the Bath area and the remaining two were plotted down into Cornwall. "Sooty" was in poor condition and clearly in no fit state to continue its journey so, after consultation with our Editor, in her capacity as Secretary

to the I.C.B.P. we clipped the flight feathers of one wing and turned him out with our other storks at liberty in the grounds where he soon settled down and spent the winter and following spring. During the summer he gradually moulted his flight feathers and became airborne again in August. He stayed with us for some weeks and made a fine sight on the wing, always returning in the evenings. At the beginning of September however the migrating urge was evidently too strong and he disappeared. He was by now in perfect condition so I hope he was able to make the long journey.

Sacred Ibis reared five young. We have bred so many of these that we released a few at liberty. They stayed well for months soaring above the grounds and foraging in the nearby fields. At nightfall they always returned to roost on the aviary containing the breeding colony. Eventually however they started to wander. One was caught and sent to Cambridge who passed it to Len Hill at Bourton-on-the-Water who kindly returned it to us. Another was reported up in the Leicester area but we never heard any more of it.

Scarlet Ibis nested and laid but the eggs came to nothing. I think that the early part of the summer was too cold and wet. The only time they really did well was the first time we bred them in 1970 and that summer there was a fairly long hot dry spell of weather.

Our self maintaining flock of Cape Penguins is at the time of writing down to nine birds—the lowest since they started to breed regularly. Part of the reason for this is that some of the original birds imported in 1962 have died obviously from old age so that the death rate has exceeded the birth rate.

The old pair of Blue and Yellow macaws reared two fine young ones, making seventeen all told since they started breeding in 1965. A pair of Red and Yellows reared two for the second year in succession. What is particularly interesting is that a pair of our own home-bred Blue and Yellows nested and laid this year. They were six years old. Unfortunately the eggs came to nothing and we hope for better luck next year. I think that this is quite as important as a first breeding if we are ever to establish breeding stocks of foreign birds.

Leadbeater's cockatoos reared one, Roseates did nothing largely due to the death of our old breeding hen the previous winter. We have kept several of her progeny but so far they do not appear to be mature enough to breed. Citron Crests hatched a chick but let it die. Umbrella cockatoos reared a nice young one—the third in four years. They never have more than one at a time.

Illiger's macaws reared two fine young and Derbyan parrakeets two. Bellas, Stanleys and Mealies all produced a fair crop of young as did White cockatiels and Lutino Ringnecks. Plumheads laid but failed to hatch. It is worth recording that for the first time in my experience a pair of Stanley parrakeets were double brooded—rearing two broods of four.

We have four species of Amazons at Rode including a pair of Orange-winged. The latter are very pugnacious and have to be kept on their own. Last spring we were as usual short of aviary space so we decided to put them in a little aviary and wing clip them so that they could wander loose during the day. In quite a short space of time they moulted the clipped flights and started to fly, since when they have been a great success as liberty birds, homing to their tiny aviary every night and sleeping in their nest box. Their colouring is a perfect camouflage and when they land in a tree, they just disappear.

New arrivals among our parrot collection in 1972 were two pairs Red-sided Eclectus, a Black Lory and a New Zealand Kea.

Twelve grey Peacock Pheasants were bred and quite a few Golden Pheasants were reared at liberty by their own mothers. Exactly how many it is difficult to say, but at least three hens were seen with young and our liberty flock is well up in numbers with immature birds. There is a good deal of extra work in rearing pheasants so we now concentrate on rearing the more valuable species by hand and just raise a few of the common ones to keep the numbers up.

We have a somewhat elderly cock Himalayan Monal kindly deposited with us years ago by the Rev. P. K. Venner. This bird is infertile so we decided to give him his liberty on the grounds. As usual with pheasants, from being a nervous bird in an aviary where we hardly saw him, he has become quite tame and looks truly splendid as he strides about at the edge of the wood. He is full winged but never flies except to roost. We see far more of him than of those kept in an aviary.

Blue Crossbills have been a disappointment as liberty birds. We built up a flock of nine which stayed well for a while, but the cock became aggressive in the spring and they scattered over the surrounding countryside, never to be seen again. We have found the same with Swinhoe's which, once they are mature, are solitary and aggressive. New arrivals in 1972 were two immature Great Argus Pheasants. They were purchased as a pair but I am afraid are moulting out two cocks.

Our liberty flock of Carolina Ducks continues to increase and we have counted as many as fifty birds at feeding time in the winter. At least one pair with young have been seen on the River Frome nearby so there is no reason to believe that some pairs go off and rear their young unaided, bringing them back to join the main flock when they can fly. As the Carolinas increase, so do the Mandarins decrease in numbers, largely I think because the Carolinas usurp every available nest box at breeding time.

A small number of other ducks and geese were reared including Pintails, Tufted and Red-crested Pochard, Barnacle, Bar-headed and Lesser White-fronted Geese.

I have sadly to record the death of our old Lidth's Jay. This bird must have been well over twenty years old and I have previously recorded his past history.

One of our pairs of Occipital Blue Pies again reared two healthy young ones.

The following nested and laid but the eggs never hatched: Rothschilds Mynahs Andaman Mynahs, and Purple Glossy Starlings.

New arrivals among the softbill collection were Formosan Blue Pies, Black-collared Mynahs, Black Bulbuls and Azure-winged Magpies. We also managed to acquire a young male Great Indian Hornbill as a mate for our solitary female.

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BREEDING BIOLOGY AND BEHAVIOUR OF THE SOUTH AFRICAN HEMIPODE IN CAPTIVITY

By G. MICHAEL FLIEG (St. Louis, Missouri, U.S.A.)

The following studies and observations were accomplished while I was Curator of Birds at the Brookfield Zoo, Chicago. I wish to thank the following individuals who assisted me in compiling the data on egg and chick weights and measurements: Paul R. Meppiel, John Gruetter, and Ann Owens.

In September 1969, three pairs of South African Buttonquail *Turnix sylvatica lepurina* were obtained from a local dealer. They were imported, wild-trapped birds. They were placed in a cage 3 × 1 metre which they shared with Nyassa Love birds, Double-banded Sandgrouse, Kittlitz Plover and Chestnut-backed Sparrow-lark. The African Waterhole exhibit as it was called was provided with sand and plastic boxhood mounds. All of the above species got along quite compatibly. The breeding of the hemipode appears to be first recorded for the Americas.

FEEDING

The Hemipodes were fed on Purina Game Bird Chow mixed with Purina trout chow and small seeds. During breeding, mealworms were supplemented. Food items offered to the other residents of the exhibit were sometimes taken. These included fruits, ground meal, oyster shell and pigeon pellets.

DESCRIPTION

The size differences between males and females are shown on Table 1. The hen is spotted along the side of the chest and neck with large black spots. The smaller male is streaked with many more smaller spots.

TABLE 1. ADULT MEASUREMENTS

		<i>Turnix sylvatica lepurna</i>	
		MALE	FEMALE
		(mm.)	(mm.)
Wing		70-82	78-90
Tarsus		20-23	21-24
Bill		11-13	13-15
Tail		32-45	35-38
Length		141-157	154-162
		(gm.)	(gm.)
Height		34.5-47.5	54-62.9

CALLS

The calls I can attribute to this species are as follows:

The flock call is a high pitched almost inaudible chirping sound.

The alarm call is similar but much louder.

The female utters the courtship booming sound, and a growling buzz used to threaten other birds.

The male utters a trumpeting buzz to threaten other males.

COURTSHIP

Courtship begins in early February. It is initiated by the polyandrous hen. She begins to take long strides—back parallel to the ground while gently rocking the body back and forth. Sometimes the hen lies down and the head and neck alone assume this rocking motion. This ritual attracts males into her territory and the next phase is performed in the presence of the cock birds. The female bends the legs and erects itself to a 45 degree angle (shown in the plate); the neck is then stretched and the oesophagus inflated producing a booming sound reminiscent of a pigeon but deeper. The female next sits and scrapes with the beak. The male then gently pecks her head and nape and copulation occurs. The female sometimes takes this initiative and mounts the male. As far as I know this is the only instance of a female bird mounting and actually copulating with the male.

NEST AND EGGS

A simple scrape in the sand is the nest site although the nest is usually placed alongside or under a pile of straw or artificial plants. The female rolls the eggs about in all directions for 10-20 cm.; later in the day they were rolled back into the nest. The normal clutch is four eggs but six or eight eggs were sometimes found in one nest probably the result of two hens laying in it. As many as eight nests were built for the three pairs of birds and eggs were deposited in each. They are rolled by the female; she uses her beak and backs up rolling the egg between her legs. The first egg was laid on 25th February 1971, eggs are 20 to 28.5 mm. in length and 16-20 mm. in width. They weigh 2.75 to 5.1 gms. The ground colour is cream and they are streaked, spotted or blotched with chocolate brown. The three hens laid a total of 302+ eggs from 2



South African Button Quail

Courtship posture of female; male on eggs; chicks; male feeding young

[Reproduced in half tone from the painting by David McKelvey]

[illegible]

Year	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1950	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

February to 24th September. This averages out to 100+ eggs per hen in a seven month period or an average of an egg per hen every other day.

Amazing as this may seem the following observations are more startling.

On 26th May at 1.30 p.m. all eggs were taken from the cage. The next day at 2.10 p.m. five eggs had been laid. At 11.20 a.m. on the 28th, 19 eggs were evident. The three hens therefore laid 14 eggs in 20 hours. The largest hen was observed laying an egg at 8.00 a.m. and again at 11.00 a.m.—two to three hour interval. At 8.15 a.m. on the 29th there were 27 eggs in the cage and at 5.05 p.m. the same day 35. A total of 43 eggs were removed at 10.30 a.m. on the 31st. Egg laying then tapered off a bit as on 1st June there were seven eggs, on the 2nd eleven, and at 10.45 a.m. only 14. At the peak of laying—28th–29th May—the average eggs laid per 24 hours was 5.4 and 4.2 respectively. Only one ovary was functional as determined by X-ray and dissection.

(*Editorial Note.* The very striking egg-laying results which Mr. Flieg records appear to be unique not only for this species but for birds as a whole. In order to maintain a more balanced picture it should perhaps be pointed out that previous observations on the breeding of this and other *Turnix* species in captivity have shown a more typical egg-laying rate of one per day. Mr. Flieg's results suggest some abnormal factors present over a seven-day period when observations were made. His reference to paper-thin shells may also indicate this since Schonwetter's eggshell data give a similar shell-weights for this species and the Painted Quail.

Mr. Flieg's further comments as follows—"My hypothesis on the *Turnix* egg production is this. We may assume that in the natural state a hen lays a clutch with one mate, finds another and repeats the performance. However, in a crowded situation in direct competition with other hens for several males, the stimulus of the presence of the males may be enough to increase the hormone flow and speed of ovulation; this being a direct result of intraspecific competition. This theory requires of course careful testing to see if it is correct".)

The male alone incubates the eggs but in the confines of the cage it became an impossibility. The broody males were constantly harassed by the hens until they deserted the eggs. Only once was a male able to hatch a clutch in the cage. The incubation period is 12–13 days.

INCUBATION AND HATCHING

Most eggs were taken from the cage immediately and placed into a forced air incubator at 99½°F and 85°F on the wet bulb. Out of a total of 43 eggs laid between 25th February 1970 and 23rd January 1971, 127 eggs hatched and 54 chicks were reared to maturity. After pipping the eggs the chick always hatched in 10–20 minutes. The egg shell was paper thin. The fertile eggs lost an average of 18% of their initial weight and the hatching weight of the chicks varied from 2.2 to 3.09 grams with an

average weight of 2.67 gm., perhaps the smallest precocial bird. At hatching the total body length is 42–45 mm., the wing 7–9 mm., tarsus 9–10 mm., bill 4.5–5 mm. Female chicks can be distinguished at two days of age as they boom and assume the courtship stance of the adult.

FEEDING

The newly hatched chick is a bill feeder and is fed by the male. The male picks up the food items and offers them to the young which snatch them greedily. We start the young birds on very tiny mealworms. Within two to three days they are feeding themselves on mealworms, game bird crumbles, and tiny grass seeds sprinkled with LIV as a supplement. The chicks are fed many times at least once per hour and after feeding are called back to be brooded by the male.

We tried unsuccessfully to hand-feed the young although they were fed many times day and night. Males were not broody in the presence of hens but when isolated from the females they never refused to accept chicks. At one time, when a group hatched, too large for one bird to accommodate, we introduced another male into the same cage and both birds assumed care of the young. The chicks that hatched in the communal cage would run to the hen also for food, taking it from her beak although she had no intention of feeding them.

CAPTIVE MANAGEMENT

For optimum breeding in the species, it is important that a sex ratio of two to three males per female be used. Males can then be removed to rear the young without loss of fertility. Males are very broody and two or more can be placed into a single cage with their broods without any fear of aggression. The young are able to take care of themselves at about three days of age and can safely be removed from the parent at age 5 days.

GROWTH AND MATURATION OF YOUNG

The chick hatches with only down. On the second day the primaries begin to show and the down attached to their tips, and the quill-sheath slough off them on the 14th day. The hatching weight is doubled at one week of age. Flight is achieved at 7–11 days of age. At this age feathers appear on the rump, back and sides of back. At 13 days of age feathers begin on abdomen and middle breast. On the 18th day head and thigh quills appear, the downy tips fall off the tail-feathers and full plumage attained. On the 22nd day yellow appears on the throat and minimum adult proportions are achieved at 27 days of age. At this point the male growth curve levels off and females continue to grow. At 37 days of age copulation occurred among the young birds and at 39 days sexes are distinguishable by size, weight and measurements. The first eggs are laid at age four months. The Growth and Maturation of this species was contrasted with that of a Galliform bird, the Painted Quail.

Excalfactoria chinensis. The results are shown in Table 2. The indication is that hemipodes are much faster growing and maturing.

TABLE 2
CONTRAST IN GROWTH AND MATURATION BETWEEN A HEMIPODE
AND A GALLIFORM BIRD

	<i>Turnix sylvatica lepurna</i>	<i>Excalfactoria chinensis</i>
Egg size	20-28.5 × 16-20 mm.	20-27 × 18-22 mm.
Egg weight	2.75-5.1 gm.	3.05-5.6 gm.
Weight loss of fertile eggs ..	18%	12%
Weight of chick	2.2-3.09 gm.	2.1-3.25 gm.
Primaries begin	2nd day	7th day
First juvenile plumage	18 days	30 days
Age of sex differentiation	27 days	30 days
Age of adult size	39 days	50 days

SUMMARY

Observations were made on the South African Hemipode, *Turnix sylvatica lepurana*. Calls, courtship and nesting behaviour are described. During a brief period birds were noted laying five eggs per day. Incubation and hatching data are given. The male feeds the young at first; and a technique is described for successful rearing. Growth and maturation of the young is described, and contrasted with that of the Painted Quail. The hemipode is sexually mature at 37 days although no eggs are produced until the female is four months old.

* * *

KEEPING AND BREEDING THE COLLARED
SCOPS OWL

Otus bakkamoena

By B. SAYERS (Chelmsford, Essex, England)

INTRODUCTION

Although diverse species of the Strigiformes are distributed over the entire surface of the earth, with the exception of the Antarctic, and many of these species have been known to aviculture for many years, relatively little detailed information seems to have been recorded in concise form. When I decided to specialise in keeping and attempting to breed Owls in 1970, I resolved to make a modest contribution to recorded information. The present notes refer to the Collared Scops Owl, the reason being that a friend of mine, Mr. Harry Smith succeeded in breeding this species in 1972 and due to pressure of business he has asked me to record the details. The information recorded below is an amalgam of Mr. Smith's experience in breeding these birds, a collation of extracts from the writings of other authors and my own experience in maintaining two males in captivity for three years.

If any readers of this magazine can enlarge on, corroborate or have any reason to think any of the remarks erroneous, I hope that they will either write an article or letter to the editor, or to me. It is only by pooling information that any significant contribution to science can be made.

DESCRIPTION

The sub-species of *Otus bakkamoena*, are from written descriptions very similar in appearance and the identification of an individual would seem to be rather difficult without access to a comprehensive reference collection.

For a detailed description, I include the details of the colouration of my birds, which although imported from Northern India are of uncertain identity. Iris dark brown. Eyelids and tear streak dark brown, the edges of the eyelids are pink. Face fawn. Lower eyebrow white, the upper eyebrows which stretch to the upper side of the ear are fawn. The face is edged with dark brown. The crown is dark brown, mottled with lighter shades of brown. Breast fawn, with pronounced broken vertical barring of dark brown, faint transverse barring of greyish brown. Back medium brown, mottled with dark brown—edged with a row of fawn feathers. Flight and tail feathers horizontally barred with alternate stripes of light and dark brown. Legs feathered, but toes naked, toe colour greyish pink. Claws horn coloured with grey tips. Cere pink, beak horn coloured. Length $8\frac{1}{2}$ ins.

The species has a wide distribution, from the Persian Gulf through Pakistan, India, Burma, China, Japan, Korea and Ussuriland and south through Indo-China, Malaysia, and Indonesia, to Java, Borneo, and the Philippines.

CALLS

Various authors give the call as "too-who", "kwo-oo" or "wo-wo-wo-o, o-o" and also mention another call of "kwow" repeated in quick succession.

My own birds (two adult males and the two sub-adults bred by Mr. H. Smith) utter a call of "he-ooo", with the first syllable more emphasised and higher in pitch. They also repeat a growling "kwow" in quick succession, the head being thrust forward and bowed with each call. My birds also emit a greeting call either to each other, or to me when they approach their flight with food, which can be best described as a plaintive mew. I have also observed my birds looking into each other's faces and making a twittering call.

When alarmed or angry, my Collared Scops Owls fan their wings, thrust their heads forward, clap their beaks and make a deep throaty growl.

FOOD

Authors cite insects as forming the bulk of the Collared Scops Owl's diet, although birds, small rodents and bats are mentioned. My birds readily take white mice and day old chicks, the latter being preferred. I have offered live locusts, but although some were taken, they were mostly ignored; mealworms remained in the flight for many days, but as they were not touched were ultimately removed.

It might be opportune to mention here, that in the past and to a lesser extent today, many captive raptors die unnecessarily as the result of incorrect feeding. My two original birds were bought by a friend of mine who saw them at a well-known dealers', after admiring them but explaining that she was unable to provide a suitable diet, the vendor explained that he was feeding them entirely on minced raw beef and that was perfectly adequate. After being assured that beef was a suitable diet, my friend bought two of these Owls, but after they settled in her accommodation it was obvious that both birds were seriously ill, being very thin and weak. Fortunately the diet was immediately changed to mice and a complete recovery was made by both birds, which were then transferred to my collection. Subsequent investigation showed that the dealer in question imported several small Indian Owls, but all gradually deteriorated in health and I feel certain that this deterioration can be attributed to the unsuitable diet. Another instance brought to my notice, was that of a dealer who imported a number of Scops Owls and only offered whole Guinea pigs as food. Of course, such large carcasses are totally unsuitable for small Owls as they are unable to break them up. I understand that this thoughtlessness caused the death of most of the Owls.

I think that the rule that should be applied to all Owls, is that they should be fed whole carcasses (insect, bird or mammal) which are of a suitable size to be eaten in their entirety.

NIDIFICATION

The Collared Scops Owl nests in hollows in trees, cavities in buildings, cliffs or in the bases of large nests, such as those of Vultures. Two to five white eggs are laid from December to April depending upon locality and measure in average of 35 mm. \times 28 mm.

BREEDING IN CAPTIVITY

It would seem that Scops Owls have so far only been bred infrequently and I can find no previous record of the Collared Scops Owl breeding in this country.

The Scops Owl, *Otus scops*, (Meade-Waldo 1899) and White-faced Scops Owl, *O. leucotis*, have been bred in captivity and Prestwich (1955) states that two Plume-footed or Half-Collared Scops Owls, *O. b. semitorques*, were listed in the sale catalogue for Spedan Lewis' famous collection of Owls, with the information that they "have nested". However although I

have searched through available literature, I can find nothing to indicate that any youngsters were reared.

The Collared Scops Owl was bred with considerable success at the Zoological Gardens Dehiwela, Ceylon, during the 1940's. Several pairs were kept in a large aviary along with a solitary Black Bittern. Nest-boxes were situated in opposite corners of the aviary and the birds bred frequently.

The birds bred by Mr. H. Smith at Basildon, Essex, were imported during the summer of 1970 and were thought to be two males and two females. The four birds were housed in an outside aviary in Mr. Smith's collection which, until 1971, was in Devon. In 1971 the collection was moved to Essex and while a new zoo was under construction, the Collared Scops Owls were housed temporarily in a 4 ft. stock cage in a draught proof and well lighted, but unheated, shed. It was in this accommodation that the breeding occurred.

In early May 1972 it was noticed that two of the Scops Owls had paired and courtship behaviour was observed, therefore two nest-boxes each 12 in. \times 12 in. \times 12 in. with a vee-shaped entrance hole, were stood on the floor in opposite corners of the cage. The mating pair occupied one box immediately and three eggs were laid, all hatched, but one disappeared after a week. The remaining two youngsters were reared without problem and left the nest-box when between five and six weeks old. The youngsters were identical in size and colouration to the parents, there would appear to be no juvenile stage regarding colouration. Unfortunately it was not possible to examine the nest frequently, so period of incubation, dates of laying, hatching etc. are not known. The adult birds were rather shy and resented disturbance, so they were left alone as much as possible. The two other adult birds remained in the cage throughout this period and no friction was noticed.

Mr. Smith's owls are all fed entirely on chicks and the Collared Scops Owls reared two strong youngsters on this diet without additives. They also had clean water for bathing always available. Many owls bath frequently and my Collared Scops bath on average three times a week. I have on several occasions observed incubating owls of various species bath and then return to the nest with the feathers very wet. I think therefore that it is most important that bathing facilities are always available for incubating owls, as they would seem to use this method of adjusting the humidity of the nest to the correct level for hatching. It should also be noted that owls will not normally bath in water that is stale or dirty.

When independent, Mr. Smith's two young owls were transferred to my collection and on comparison proved to be identical in size, markings and colouration to my two original birds (described earlier).

With only Mr. Smith's breeding pair of certain sex, it is difficult to make any meaningful observation on factors that indicate a bird's sex, however going purely on this very slender evidence it would seem that the female is larger and has darker and more pronounced marking on the crown. This however may first prove to be individual variation.

CONCLUSIONS

Obviously with my limited experience and the scanty information at my disposal any conclusion will have to be recognised as being provisional. It would seem that Scops Owls can be bred in captivity without too much trouble, the paucity of previous successes, probably results from few attempts rather than insurmountable problems.

As described above, the Collared Scops Owl, *Otus bakkamoena*, has been bred by Mr. H. Smith. It is believed that this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Assistant Editor.

REFERENCES

- HADE-WALDO, E. G. B. 1899. Nesting of the Scops Owl. *Avicult. Mag.*, 5 : 159-160.
 WESTWICH, A. A. 1955. Records of Birds of Prey Bred in Captivity.

* * *

NEWS FROM THE BERLIN ZOO

By PROFESSOR DR. HEINZ-GEORG KLÖS

Rare newcomers are a pair of Iris lorikeets (*Psitteuteles iris*). These birds have so far only a few times been offered for sale by dealers and are not well known to scientists. Even detailed special works contain but few data on the habits of these parrots, so our zoo is very glad now to keep a pair of them.

Though breeding successes in autumn and winter are not too frequent, we did have some as follows:

5 Eastern Turkeys (*Meleagris gallopavo silvestris*), 1, 1 Silver Pheasants (*Phasianus n. nycthemerus*), 3 Rock Doves (*Columba livia*), 3 Olive Pigeons (*Columba arquatrix*) and 5 Budgerigars (*Melopsittacus undulatus*).

New arrivals include:

2, 1 South African Shelduck (*Tadorna cana*), 1 Ruddy Shelduck (*Tadorna ferruginea*), 1, 1 African Pochards (*Netta erythrophthalma brunnea*), 1 Barrows' Goldeneyes (*Bucephala islandica*), 4 Goosanders (*Mergus americanus*), 4 Red-breasted Mergansers (*Mergus serrator*), 6 White Storks (*Ciconia c. ciconia*), 6 Black Storks (*Ciconia nigra*), 2 Painted Storks (*Myiarchus leucocephalus*), 1 White Spoonbill (*Platalea leucorodia*), 1 Common Noddy (*Lophophorus impejanus*), 1 Emerald Dove (*Chalcophaps indica*), 4 Pondicherry Vultures (*Sarcogyps calvus*), 1 Old world Sparrowhawk (*Falco t. tinnunculus*), 1, 1 Gang-gang Cockatoos (*Callocephalus fulvus*), 1, 1 Cockatiels (*Nymphicus hollandicus*), 1, 1 Iris lorikeets (*Psitteuteles iris*), 3 Keel-billed toucans (*Ramphastos sulfuratus*), 2 Gold-fronted fruit-suckers (*Chloropsis aurifrons*), 3 Superb tanagers (*Tangara*

fastuosa), 2 Blue-and-black tanagers (*Tangara velia cyanomelaena*), 1,1 Three-coloured mannikins (*Lonchura m. malacca*), 0,2 Golden-breasted waxbills (*Amandava subflava*), 2,2 Crimson Seed-crackers (*Pyrenestes sanguineus*), 1,1 Peter's twin-spots (*Hypargos niveoguttatus*) and 1,1 Melb finches (*Pytilia melba*).

* * *

NEWS AND VIEWS

In view of the concern felt about the possibility of extermination of some of the Amazon Parrots of the Caribbean region it is pleasing to hear of the first breeding of Guilding's Amazon, or the St. Vincent Parrot, at the Houston Zoo, Texas. The breeding was from two of five birds from various zoos and individuals brought together for this purpose. One young one was raised.

* * *

David Lack and family, who visited St. Vincent in 1971 to study the bird-life saw this parrot in all rain-forest areas that they visited and commented that "it should survive provided enough rain forest survives". Like a number of other rare bird species its ultimate fate appears to depend largely on the lumber industry. It appears, however, to be in a slightly better state than the Puerto Rican Parrot which, according to a recent study by Dr. Kepler, has declined from c. 189 in 1969 to c. 15 in 1971. Faced with reduction of the forest to a rather limited relic in an area of poor weather conditions, with loss of nest-holes through tree-felling, and with a population explosion of the competing Pearly-eyed Thrasher reducing existing sites and preventing the possible provision of new ones, plus a population now so small that capture for captive breeding is difficult, the species is in a very bad position.

* * *

Mrs. Marsault, who recorded in the magazine in 1969 egg-laying and incubation by her Guillemots in Devon had further success in 1972 when an egg hatched. Unfortunately she was ill at the time and unable to give the young one special attention and it lived only for five days. It is, I think, the only hatching of an auk in captivity on this side of the Atlantic. In the U.S.A. they had a more complete success with the breeding of the Tufted Puffin at the New York Zoological Park in 1970.

* * *

Apart from Albie the Albatross whose life in a zoo was recorded in the magazine a few years ago, the procellariiform birds are more unlikely avicultural possibilities than are the auks. In the Ibis for 1972 David Wingate describes how he hand-reared an orphan of the near-extinct Bermuda Cahow Petrel, feeding it on a mush of squid and shrimps (both apparently available in frozen form from the local supermarket in Bermuda).

forced down the young birds throat with a squeezeable ketchup bottle. He had the satisfaction of rearing it successfully and seeing it take off for sea with other young.

* * *

My only acquaintance with these birds in captivity was when I visited Miss C. A. Nicholls at Perth, Western Australia in 1966. She tended wrecked or injured sea-birds as well as other casualties. A large suburban-type garden had, in addition to other occupants such as an Australian Magpie with a fondness for attacking bare toes in sandals, two young Giant Petrels wandering among the shrubs, having been kept for over a year and a Black-browed Albatross with an eye injury sitting on the lawn. In a wire-netting aviary were several Slender-billed Shearwaters and a pair of these had actually burrowed and laid an egg. I believe that this at least constitutes an avicultural record at present.

* * *

I was pleased to see that accounts of first breedings recently included, as well as records of the rare and difficult, the apparently first breedings of a waxbill species and one of the commoner bunting. There seems to be a general assumption that if a bird is relatively expensive and fairly easily obtained then it must have been bred in captivity and everything about it must already be known. The first is very often untrue, the second almost always untrue.

* * *

The latest number of "Captive breedings of diurnal birds of prey" by the British Falconer's Club and the Hawk Trust records, inter alia, the breeding of the Sparrowhawk, *Accipiter nisus*, in Devon in 1971 and 1972 by Dr. L. H. Hurrell. Single young were reared in each instance. The Hawk Trust also records the breeding of a Caracara after eggs had been laid in two earlier seasons. This is presumably the Crested Caracara, *Byborus plancus*, although the species is not stated.

* * *

We have heard from Mr. Bertagnolio that the Council of the Italian League against the Destruction of Birds is attempting to reintroduce the Egyptian Vulture which has disappeared from most of Italy except the extreme southern tip and on Sicily. A captive breeding programme is being started with four birds. Mr. Bertagnolio comments that they had earlier hoped to do a similar project with Eagle-Owls but had been unable to obtain birds from reputable sources.

* * *

Readers of the magazine will probably have noticed that in articles dealing with the behaviour of aviary birds, and particularly with regard to waxbills, there is often some reference to Desmond Morris's writings on the subject. Mr. R. U. Lambert has written pointing out that a number of these very interesting, if at times a little technical, studies by Dr. Morris

have been brought together in the latter's book "Patterns of reproductive behaviour" originally published by Cape but now available in paperback by Panther Books.

* * *

Among breeding of native species last year two exceptional occurrences, although not a first, were the breeding of the Nightingale by Frank Meade and Mick Barber. Since the last documented breeding seems to have been in 1851 it is good to have news of more recent success.

C. J. O. H.

* * *

COUNCIL MEETINGS

A Council Meeting was held on 27th September, 1972, at the Linnean Society.

The following members were present:

Miss Phyllis Barclay-Smith (Vice-President) in the Chair.

Dr. Jean Delacour, Mr. M. D. England, Dr. C. J. O. Harrison, Mr. F. E. B. Johnson, Mr. K. A. Norris, Mr. P. J. Olney, Mr. C. Payne.

Mr. H. J. Horswell (Hon. Secretary), Mrs. Mary Haynes (Assistant Hon. Secretary).

ELECTIONS

Following the resignation of Mr. A. A. Prestwich as President of the Society, Dr. Jean Delacour was unanimously elected to fill this office and was pleased to accept.

* * *

A Council Meeting was held on 21st February, 1973 at 20 Bourne Street, London, W.1.

The following members were present:

Miss Phyllis Barclay-Smith (Vice-President) in the Chair.

Mr. J. O. D'Eath, Mr. M. D. England, Dr. C. J. O. Harrison, Mr. K. A. Norris, Mr. P. J. S. Olney, Mr. C. M. Payne, Mr. D. H. S. Risdon, Mr. J. J. Yealland.

Mr. H. J. Horswell (Hon. Secretary and Treasurer), Mrs. M. Haynes (Hon. Asst. Secretary).

THE PRESIDENT'S MEDAL

Council was pleased to award the President's Medal to Mr. Walter Van den bergh, Director of Antwerp Zoo for his contribution to Aviculture in connection with the Congo Peacock.

THE SOCIETY'S MEDAL

The Society's Medal was awarded to:

Mrs. N. Howard for the first breeding of the Hawk-headed Parrot (*Deropterus accipitrinus*), 1973.

R. W. Phipps for the first breeding of the Blue-streaked Lory (*Eos eticulata*), 1973.

CERTIFICATE OF MERIT

The Society's Certificate of Merit was awarded to:

Winged World (B. S. Ward) for the first breeding of the Toucan Barbet (*Semnornis ramphastinus*), 1973.

ELECTIONS

Mr. D. Risdon was elected to serve as Vice-President. Miss P. Barclay-Smith, Sir J. McCullagh and Mr. G. S. Mottershead were re-elected for a further term of office as Vice-Presidents.

COUNCIL MEMBERS

The following were elected to serve as Council members:

Mr. P. B. Brown, Mr. F. Meaden, Mr. H. Murray, Mr. R. Sawyer, Mr. Newton R. Steel, Mr. W. Timmis.

H. J. HORSWELL,

Hon. Secretary and Treasurer.

* * *

BRITISH AVICULTURISTS' CLUB

The one hundred and eighth meeting of the Club was held at the Windsor Hotel, Lancaster Gate, London, W.2. on 8th February, 1973, following dinner at 7.30 p.m.

Chairman: K. A. Norris.

Members of the Club present: R. A. Chester, R. A. Copley, Mrs. W. Cuggan, M. D. Coulter, Miss Ruth Ezra, M. D. England, R. H. Grantham, Mr. C. J. O. Harrison, R. T. Harvey, Mrs. M. Haynes, L. W. Hill, Mr. J. Horswell, E. F. Housden, C. Jackson, B. F. Jones, J. Kuttner, Mr. Kyme, H. Kenyon, F. Meaden, Neil O'Connor, Mr. and Mrs. W. George, B. Sayers, Mr. and Mrs. G. Schomberg, R. Sawyer, Newton R. Steel.

Members of the Club present, 28; guests 27.

Members of the Club very much enjoyed a most interesting talk by Mr. Derrick England, entitled "An Aviculturist Around the World with a Camera", which was illustrated by superb coloured slides of birds taken in the course of his travels.

MARY HAYNES,

Hon. Secretary.

NOTICE

BREEDING OF THE BLUE-BACKED MANAKIN AT THE
LONDON ZOO

The Editor apologises to Mr. J. P. J. Olney that the usual note regarding a first breeding was not appended to his article on "Breeding the Blue-backed Manakin *Chiroxiphia pareola* at London Zoo". Published in the January/February number of the Magazine—pages 5-7.

It is believed that the breeding of the Blue-backed Manakin may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate once with the Assistant Editor.

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- A. BOOTH, 2nd/Stwd., to M.V. Trebartha, P & O. General Cargo Division, Beaufort House, St. Botolph Street, London, EC3 A 7DX.
A. H. BROOKING, to Longacre, Benton's Dial Post, Sussex.
A. HANSEN, to Torslundvej 117, D.K. 2630, Taastrop, Denmark.
K. S. Harrap, to 1 Umganin Road, West Sumerton, Bulawayo, Rhodesia.
B. LIAUZU, to Parc Zoologique, "Les Demevers", St. Pourcain, S/Besbre 03, France.
A. PLATT, to 264 Beacon Road, Wibsey, Bradford 6, Yorkshire.
C. G. ROOTS, to Assiniboine Park Zoo 2355, Corydon Avenue, Winnipeg, Manitoba R3P0R5, Canada.
W. VANDEVIJVER, to Golfaan 19, 9830 St. Martens-Latem, Belgium.
A. L. WHEELER, to 700 Fern 14, McAllen, Texas 78501, U.S.A.

NEW MEMBERS

The 53 Candidates for Membership in the January-February 1973 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

CANDIDATES FOR MEMBERSHIP

- A. F. ALPIN, Donaldsons School for the Deaf (Senior Dept.), West Coats, Edinburgh, Scotland.
D. BENDING, 8, Joan Court, Noble Park, Victoria 3174, Australia.
BENGT JOHANSSON, Rödalidsvägen 4, S-417 28, Gothenburg, Sweden. Proposed by T. Brosset.
V. BERRY, 15 Colindale Park, Dunmurry, Co. Antrim, N. Ireland. Proposed by R. L. Henshaw.
BICKELL, Ostrich House, Burnham Overy, Kings Lynn, Norfolk. Proposed by R. Kyme.
V. FREY, The Canary Bird Farm, Englishtown Road, Oldbridge, N.J. 08857, U.S.A. Proposed by A. L. Tyler.
GRUNENBERG, P.O. Box 638, Panguna-Bougainville, New Guinea.
MRS. R. M. HALE, 178, Parkwood Road, West Islip, New York 11795, U.S.A. Proposed by R. B. Stewart.
J. HILL, 4901 Phinney Avenue North, Apartment 303, Seattle, Washington 98103, U.S.A.
LEWIS, Orchard Cottage, Heaselands, Haywards Heath, Sussex. Proposed by R. Kyme.
LUNDSTROM, PL. 394, Mannarp S-310 40, Harplinge, Sweden. Proposed by T. Brosset.
J. MUNDEN, Qnarr, Bridge Road, Cranleigh, Surrey. Proposed by Mr. Norris.
PETCH, Ridgeland, Ridge Road, Kalorama Victoria, Australia.
R. PICKERING, 41 Lumley Avenue, Skegness, Lincolnshire. Proposed by R. Kyme.
PRESCOTT, 6, Goore Avenue, Sheffield, S949E. Proposed by R. A. Harper.
RICHARDS, 32, East Street, Warminster, Wilts. Proposed by R. Kyme.
G. B. SHULTE, Floralaan West 272, Eindhoven, Holland.
W. STODDART, 163 Flatts Lane, Normanby, Middlesbrough, Teeside TS6 0DD.

CORRECTION

MR. D. GAINEY, Milton Cottage, Lower Street, **Eastry** not Gastry, Nr. Sandwich, Kent.

DONATIONS (Colour Plate Fund)

The Council wishes to thank the following Members for their donations to the Colour Plate Fund

J. Delacour
W. Duggan
W. A. Howe
Dr. J. Ingels
Klaus-G Mau
R. Nelson

Dr. H. S. Raethel
S. Rognlien
Dr. L. A. Swaenepoel
J. D. Willmott
E. De Winter

Will Members please donate their surplus books on birds to the Society for the benefit of the Colour Plate Fund.

URGENT—SUBSCRIPTION REMINDER

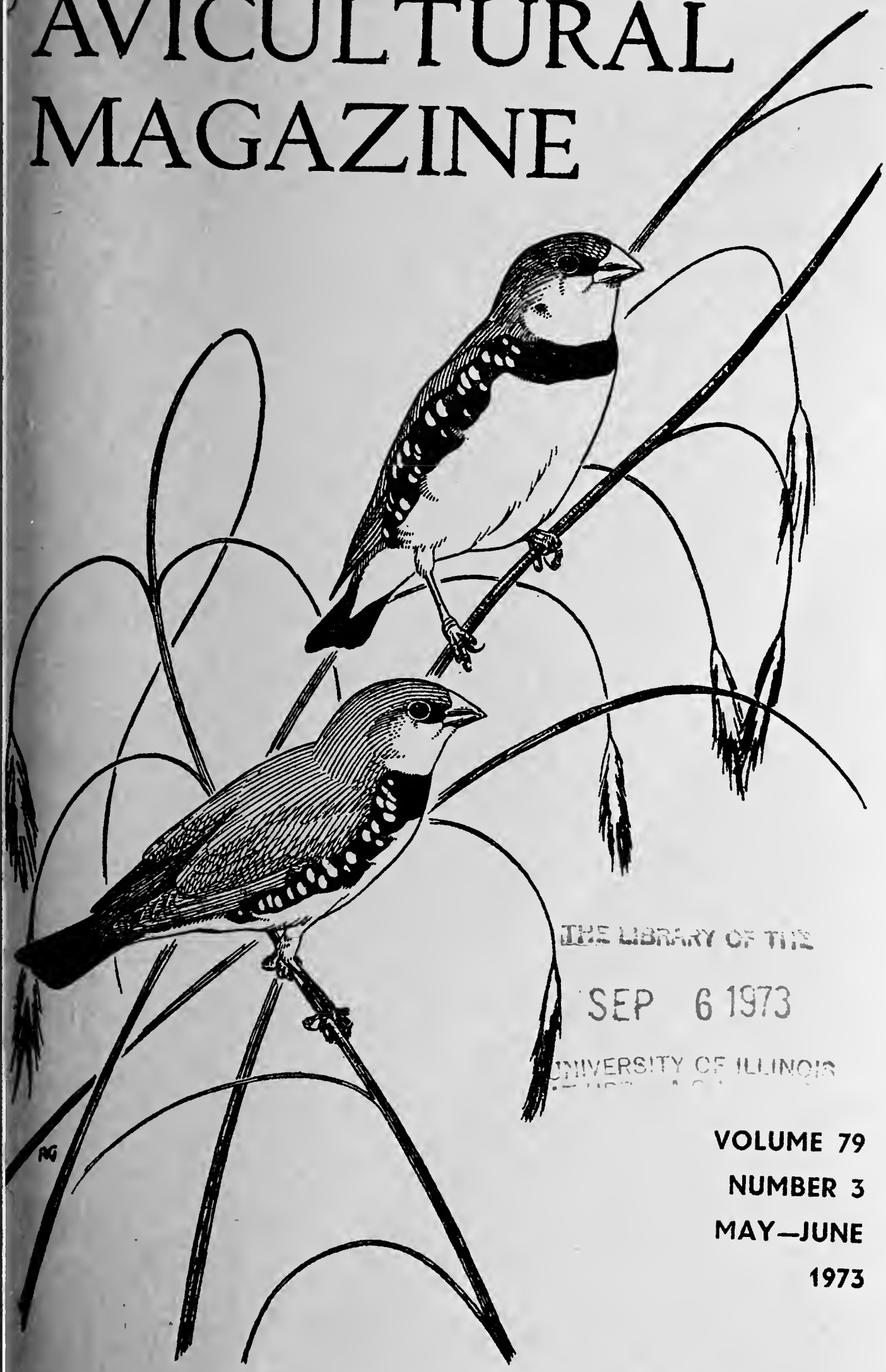
Subscriptions for 1973 were due on 1st January. Members who have not already renewed their Membership are asked to do so immediately to ensure receipt of the next Magazine.

Hon. Secretary & Treasurer.

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AVICULTURAL MAGAZINE



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THE AVICULTURAL SOCIETY

Founded 1894

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**Hon. Secretary and Treasurer: Harry J. Horswell, 20 Bourdon Street
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MAY-JUNE 1973

THE LONG-TAILED TIT

By C. J. O. HARRISON (Berkhamsted, Herts., England)

The Long-tailed Tit, *Aegithalos caudatus*, is one of the loveliest of our small, native species. It presents some difficulties as an avicultural subject. It is one of those very small, constantly active species; finding any morsels of food on the twigs, branches and leaves of trees and shrubs. It appears to have a high metabolic rate and a need to constantly stoke-up with food, and therefore requires careful provision of food to ensure that it is available when needed and also to ensure that each individual is able to obtain a reasonable share.

Works on ornithology do not suggest any way of sexing this species, but some aviculturists who have had experience in keeping them are of the opinion that they can normally be sexed by comparison of the head markings. On either side of an otherwise pale head a bold dark band of blackish brown extends back over the eye to the nape. In the living bird, this is certainly varied between individuals, and the fine photograph by Derek Washington, used as a frontispiece for this number of the magazine, shows a close view of the heads of two young birds, illustrating the extent to which these markings may vary. Birds with broad markings are said to be males, those with narrower markings females. Unfortunately this variation is not apparent to the same extent in museum specimens, possibly as a result of movement of the skin during preparation of preserved specimens and it is not possible to cross-check from this source. In view of the variation in plumage pattern and colour throughout the geographical range it is possible that this sexual difference would only apply to some races. Another problem for the aviculturist who tries to breed this species is the provision of suitable nest material. One principal constituent, which sticks together the fragments of moss and lichen to form the domed nest of the Long-tailed Tit is fresh spiders' webs. Spiders' webs are a natural material which is usually to hand somewhere in a wild area, but is extremely difficult to supply in adequate quantities in the confines of an aviary, and I have not heard of a really effective and generally available substitute. It is perhaps a mercy that so few of the birds which we try to keep need this material to bind the nest together. If one examines the breeding birds in tropical and subtropical regions, it becomes apparent that a surprising number of smaller, insectivorous birds use this material and a similar element for binding and shaping the nest. In such regions spiders are likely to be larger and more plentiful and there is likely to be a more adequate supply of bigger and stronger spiders' webs to utilise for this purpose.

ON KEEPING FREE-WINGED WATERFOWL

By J. O. D'EATH (Monken Hadley, Herts, England)

Having eschewed an interest in ornithology at an early age it was in my two closing years at school that my attention became focussed more specifically on aviculture and waterfowl in particular. Thus it was in 1929 that I based the foundations of my collection. It started in a modest way with several Common Shelduck (*Tadorna tadorna*) reared from eggs lifted in the wild on the Somerset coastline. During the passage of time, now some 40 years, the collection grew in size and accommodated as many as 90 different species including some rarities and one derived great pleasure from breeding successes personal or otherwise, but of course disappointment and failure outweighed these as it always will.

I suppose as one grows older one becomes more aesthetic in one's outlook and the appeal of seeing birds at liberty grows stronger.

Therefore in the last few years I have been prompted to experiment with free-wing species. This of course has been done by others before but the purpose of these notes is to encourage the younger generation of waterfowl keepers to be bold enough to experiment.

I must assume that the governing measure of success must be local habitat and therefore where some may succeed others may fail. It must be obvious that if one's collection for example is geographically situated near attractive wet-land or on a riverine site then losses must occur. I am situated in an urban area and, in spite of this, have been surprised at being able to hold unlikely species. I will now turn to the individual species of birds currently free-winged in the collection and comment on each.

MANDARIN (*Aix galericulata*)

Apart from being one of the most spectacular plumaged of the waterfowl this species is undoubtedly the most likely to succeed as a free-winged subject. It has of course established itself in the wild in various parts of the United Kingdom. I have maintained 10/15 pairs here for a number of years and it is an unceasing delight to see these birds flight in and land at one's feet at feeding time. In Spring I derive the greatest pleasure from seeing the Mandarin pairs prospecting for nesting sites sometimes 60 ft. up in tall trees. The late J. C. Laidlay established a similar colony in his small garden on the banks of the Tay in Perth, Scotland and he even today as many as forty Mandarin may be seen fighting in to two very small concrete pools. They also return to nest in boxes put out for them. Of the Mandarin I rear each year, I usually release about five pairs to maintain the stock. By no means all the free-wing birds nest on the property and it is usually not until the beginning of October that one

ses birds reared by their parents coming into to feed. Mandarins are very fond of acorns and may be the presence of a good number of Oaks here has some bearing on their autumnal showing.

CAROLINA (*Aix sponsa*)

A similar bird in its habits to the Mandarin but not quite so successful in my opinion. Its flight is low and undoubtedly it does not propagate itself so freely in the wild, hence one has to continually rear and release young birds to maintain the stock. Nevertheless they would appear to be good stayers.

MANED GOOSE (*Chenonetta jubata*)

Supposedly allied to the above in science and another suitable subject for liberty. I started with an unpinioned male paired to a pinioned female and have progressed from there. These birds are very confiding and tame by nature and it is nice to see them sitting on gate-posts on the perimeter fence and not taking wing till one almost touches them. A fellow aviculturist in Essex who had some of my original stock now has a sizeable free-wing colony. My Maned Geese do not seem to be arboreal in the habits as the Mandarin and Carolina, but as already mentioned use gate posts and fences for perching.

INDIAN PINTAIL (*Anas georgica spinicauda*)

At one time after the War, this species was a rare one in collections and I well remember obtaining the first two pairs to come into a private collection from a Dutch dealer. Since those early days they have been well bred and have now reached the stage where they are difficult to sell. However, on the credit side of the balance, I have found them excellent subjects at liberty and they visit the various small ponds in turn. For the first time this year a pair bred away and returned in July with four fully grown young which were caught and ringed with Avicultural Society rings. My stock are extremely tame and it is sometimes difficult to deliberately get them on wing.

DUCK (*Somateria mollissima*)

For many years now, I have made a point of not pinioning this species, to be honest not for the purpose of maintaining a liberty stock. The Eider in captivity is a gross feeder and becomes overweight and if getting on wing has difficulty in maintaining altitude. I always have adult pairs and in the last 20 years have experienced only two losses (both recovered). In both cases these were females, the latter bearing an Avicultural Society ring was recovered about 10 miles away. The other did not return. They will occasionally fly the width of the pond, more particularly in Spring.

RED-BILL WHISTLING DUCK (*Dendrocygna autumnalis autumnalis*)

This is an ideal free-wing subject and over the years according to breeding success I have always had a small number of this species at liberty. They are exceedingly tame and tree-perching, and with me never wander beyond the confines of the collection. I have likewise had the individual Fulvous (*D. bicolor*) under the same conditions. If my memory serves me right I recall a small flock of White-faced Whistlers free-winged at the famous Walcot Hall collection of Messrs. R. & N. Stevens before World War II. I think the whole family Dendrocygnae are very suitable subjects for liberty birds.

COMMON TEAL (*Anas crecca crecca*)

I would not say that this species is guaranteed to stay, but I have enjoyed reasonable success and currently have two males which have been in the collection for five years but which do disappear for brief periods.

BARNACLE GEESE (*Branta leucopsis*)

For some reason this species breeds well in the collection and I have annually liberated 6/12 birds. I think the main basis to start is to have free-wing gander paired to a breeding female. The ensuant family will then usually stay together. One can then carry it a stage farther by feather-clipping one or two of the brood for the first year. At one time I had a small flock of 12 on wing for 3 years and when they finally decided to leave they appropriately moved to the Wildfowl Trust at Slimbridge and joined the wild White-fronts, causing some consternation and head scratching among the experts who were baffled by the sudden extension of the Barnacles known range in the British Isles. Owing to lack of space I have not experimented with other species of geese, but in large collections such as Slimbridge and elsewhere a greater variety of geese have been successfully kept at liberty over the years.

COMMON SHELDUCK (*Tadorna tadorna*)

Although frowned upon by most Waterfowl keepers as a common bird this species is undoubtedly one of the most colourful of our native birds. Here again a start was made by pairing a free-wing male to a pinioned duck. Being a marine duck I was extremely sceptical of success, thinking that the call of the sea would prove too much. However, this was not the case and I now have five birds on the wing. It is interesting to note that whilst in their natural habitat of the shore-line they have no obstacle to negotiate and here they have to negotiate tall trees to effect a landing and they accomplish this with far greater expertise than wild Mallards.

KNOBNOSE GOOSE or COMB DUCK (*Sarkidiornis melanotos melanotos*)

About five years ago I reared a number of these birds, the female laying 13 eggs in her first clutch. From the surplus undisposed of I retained a pair unpinioned, which were feather-clipped their first year.

These have successfully stayed ever since and it is interesting to note that they always fly independently and not together. The male, however, does make far-ranging flights off the property and is sometimes away for hours at a time. It is always with a sigh of relief when I see him safely back again within the confines of the collection. I was anticipating that they might breed away from the property like some of the Mandarin but so far this has not occurred.

SUMMARY

As I mentioned initially, the foregoing notes are intended to encourage waterfowl keepers to experiment on similar modest lines to myself and I am sure the great pleasure they derive from any success achieved will be an ample reward. There are obviously numerous other species which would be suitable subjects for experiment and this can only be ascertained on "trial and error" principle. The free-wing plan can sometimes operate on a reverse "lease-lend" basis and I have from time to time had wild birds fly in and pair to pinioned females. Recently this Spring, a male whoveller (*Spatula clypeata*) has arrived and paired to a female in the collection and similar instances with European Teal and Tufted Duck have occurred in the past.

* * *

PLUMAGE PATTERN IN THE BUFF VARIETIES OF THE HOUSE SPARROW AND THE PAINTED QUAIL

By C. J. O. HARRISON (Berkhamsted, Herts., England)

I recently had the opportunity to observe a number of individuals of a buff strain of the House Sparrow, *Passer domesticus*, bred by Mr. T. Dooley, and through the kindness of Mr. John Dowling have received specimens of the buff variety of the Painted Quail, *Excalfactoria chinensis*. In referring to a buff variety I mean the non-eumelanic variant in which black melanin pigment is usually absent from the plumage. These two forms are of special interest, because of the extent to which not only the chestnut-red melanin but also some black-pigmented signal elements of the normal male plumage pattern are retained.

In the sparrows the females appear a light, buffy-brown. The males retain in addition the broad chestnut-red band across the side of the head and similar colour on the wings and the mantle. They also have a black throat patch present to some degree, and in most individuals some black colour is also present on the lores. One or two of the birds seen showed more extensive dark markings on the head.

This retention of marking is even more apparent in the Painted Quail. The female of this species shows typical loss of black markings in the buff variant, the plumage being buff and brown with whitish patches where the

black marks would normally appear on feathers. These pale areas were not wholly white on the specimens examined but showed a greyish-blue tint. This might be due to the retention of very small quantities of eumelanin thinly dispersed within the feather, but might alternatively be caused by the reflection of light from an unpigmented feather structure since in some non-eumelanic varieties of pigeons the unpigmented feather areas have a bluish-grey tint for this reason.

The chestnut-red pigment present in small quantities, tinting the throat, eyestripe and pale streaks of the back, and present to varying degrees elsewhere in the plumage, is retained in the variant female. Dark markings such as the ventral barring in the typical form are due to a combination of both brown and black pigment, and although the black is lost in the variant form, similar markings in brown are still present. The loss of colour is most apparent on the flight feathers and primary coverts of the wings which are almost white. The bill is still black and there is no suggestion of loss of pigment other than in the plumage.

The male quail shows a similar loss of black markings to that of the female, where the dorsal plumage and wings are concerned. The head and mantle show a series of rows of small greyish-white spots replacing black marks, but the mottling is less apparent on the back which appears mainly chestnut-red with paler longitudinal streakings. The most striking feature is that the entire ventral plumage pattern, including the chestnut-red of belly and under tail coverts, and the slate-blue of breast, flanks, forehead and tertials, is retained, apparently unchanged. Apart from a slight loss of black, producing a dark brownish-black, the bold facial pattern is also retained. One would not immediately associate this variation with the other non-eumelanic forms.

In both these species therefore a variant form occurs in which black pigment is usually completely lost but in these instances is retained in some signal markings of the male. Since there is some individual variation it might be argued that the change is produced by a gene of incomplete penetrance and that the presence of these markings merely reflects the failure of the gene to achieve its full effect.

There is, however, evidence from variant plumages in the Zebra Finch *Taeniopygia guttata*, such as the "penguin" variety, indicating that the bold black breast pattern characteristic of the male may be under separate genetic control from the remainder of the pattern and that its presence or absence may occur without affecting the remaining plumage pattern. In the House Sparrow and Painted Quail the markings that are retained in the buff variant are conspicuous markings characteristic of the species and sex. It therefore seems possible that this might be a parallel case to that of the Zebra Finch and that these markings also might be under separate genetic control from the rest of the plumage and not immediately affected by a genetic change which otherwise has a modifying effect on the plumage in general.

BREEDING SCHALOW'S TOURACOS AT THE JERSEY WILDLIFE PRESERVATION TRUST

(*Tauraco schalowi*)

By D. GRENVILLE ROLES (Deputy Curator of Birds)

DISTRIBUTION

Found in suitable localities throughout Angola, Botswana, Zambia, Rhodesia and the Southern Congo, our pair of *Tauraco schalowi* (Reichenow) came from the vicinity of Luanda in Angola. The male arrived in August 1966, the female in May 1971.

DESCRIPTION

Equal to a small pigeon in size but with a long fan-shaped tail and long pointed crest, these touracos have the typically beautiful plumage and striking appearance of the "forest-dwelling" species, with light green head, neck and breast, sooty black underparts and rump and iridescent emerald and violet-blue back and wing coverts. The tail is entirely violet-blue and the flight feathers are brilliant crimson. The bill and eye-wattle are coral red with a short white stripe in front of and a long white stripe below the large brown eyes. Legs and feet are black.

ACCOMMODATION

The aviary is approximately 20 ft. \times 8 ft. \times 6 ft. high with a shelter 5 ft. \times 8 ft. \times 9 ft. high at the rear of the flight, a nest pan 7 ins. \times 10 ins. of weldmesh covered by hessian and with a 1½ ins. \times ½ in. wooden rim, is fixed about 1 ft. from the ceiling in a dark corner of the shelter.

The flight floor is covered with a deep layer of sand over gravel, the shelter floor is covered with sawdust. The flight is planted with flowering currant *Ribes sanguineum* and *Cupressus macrocarpa*.

Sharing the aviary are a pair of Blue Eared Pheasants *Crossoptilon curvirostris* whom the Touracos ignore; neighbours are a pair of Grey Touracos *Urotrythaixodites c. concolor* with whom *Tauraco schalowi* bicker, and on the other side a breeding pair of Keas (separated by double mesh of course), who are also ignored.

PAIRING AND BREEDING

Shortly after her clearance from quarantine and a brief period in a very large aviary, the female escaped through a previously unnoticed hole in the wire netting. She remained at liberty for 6 months, feeding (from telephoned reports within a ½ mile radius of the Zoo) upon apples, blackcurrants, blackberries, elderberries and hawthorn berries. Eventually she was recaptured in excellent condition, in a cat-trap baited with orange. She was frequently heard and seen in the Zoo grounds and

provided an exotic spectacle when seen flying between groups of trees. During this period she was seen to visit a solitary individual of her species and "bill" with it through the wire in a very friendly fashion, but persistently attacked a (believed) pair of *Tauraco schalowi* in the aviary next door but one to the single bird.

On her recapture she was placed with the single specimen, who after a minutes chase, inspection, and domination, accepted her.

The birds' relationship went from strength to strength and the male, (as he was to prove himself) was seen feeding the female, who solicited this action by juvenile wing fluttering and gaping. No recognizable form of courtship was observed though when one unexpectedly alighted beside the other they would "bill", shaking their heads from side to side and "flashing" their facial pattern, while both uttering a staccato grumble.

Mating was never observed and no form of nest building was seen to take place, the first dull white egg being laid on the 13th April, 1972 in the totally unadorned nest platform. A second egg was laid on the 15th April. One of these was found smashed at the end of the flight furthest from the nest on the 20th April, the remaining egg disappeared on the 9th May.

The eggs of the second clutch were laid on the 24th and 26th May, both eggs hatching on 16th June.

The development of the chicks has been tabled below for comparison with the development of the two other species of Touraco, whose chicks we have successfully reared. The data in each case refer to the first successfully reared brood.

Both chicks described are now fully grown and in apparently perfect health.

As described above, Schalow's Touraco, *Tauraco schalowi* has been bred at the Jersey Wildlife Preservation Trust. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is required to communicate at once with the Assistant Editor.

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DATA	SCHALOW'S TOURACO <i>Touraco schalowi</i>	GREY TOURACO <i>Corythaixoides c. concolor</i>	GOLD-COAST TOURACO <i>Tauracus p. persa</i>
Incubation and number of chicks	1st egg laid 24th May, 1972. Hatched 16th June, 1972. 2nd egg laid 26th May, 1972. Hatched 16th June, 1972. Two chicks hatched together. Incubation of 22 and 20 days.	1st egg laid 1st May, 1970. Hatched 29th May, 1970. 2nd egg laid 3rd May, 1970. Hatched 29th May, 1970. 3rd egg laid 5th May, hatched 31st May, 1970. Three chicks hatched over 2 days. Incubation varied from 29 to 26 days.	1st egg laid 7th July, 1970. Hatched 28th July, 1970. One chick. Incubation took 21 days.
Day old: Weight Length Description	14 gms. 3.3 in. Very pale flesh covered with black down, bill pink with black tip, inside of mouth bright pink, legs pinkish grey with black claws. White claws on alula. 8 days—Bill orange-pink. Backs of both chicks look partially plucked and reddish. 10 days—Pinfeathers $\frac{1}{4}$ in. long visible on wings of both chicks. 17 days—Chicks believed to be receiving pheasant breeders pellets. Crest feathers coming through on both specimens, now an appreciable size difference between them. 24 days—Red area on wings of larger chick.	14 $\frac{1}{2}$ gms. 3.0 in. Pink flesh covered with charcoal grey down, bill pink with dark grey tip, inside of mouth bright pink, feet grey. Eyes opaque blue grey. White claws on alula. 10 days—Weight 71 gms. Diet on examination of regurgitated pellets consists of: soaked raisins, boiled egg, convolvulus and hawthorn leaves. 15 days—Chicks clambering about on branches next to nest. 17 days—Chicks being fed on banana. 18 days—All chicks have left nest.	18 gms. 3.7 in. Pink flesh sparsely covered with black down, bill pink, front of upper mandible black, bright pink inside mouth. Legs greyish pink. White claws on alula. 12 days—Chick covered with thick black down. Pin feathers approximately $\frac{3}{8}$ in. Long visible on wings and tail. Bill tip black, remainder of bill and facial skin white. Eye black. Rearing food so far mainly raisins, banana and mealworms. 21 days—Chick spent first night away from nest, very agile though cannot yet fly. Plumage is entirely black; purple gloss on flight feathers.
Development at			

(Continued on next page)

TOURACO DEVELOPMENT—A COMPARISON BETWEEN THREE SPECIES REARED AT THE
JERSEY WILDLIFE PRESERVATION TRUST

(Continued from page 77)

DATA	SCHALOW'S TOURACO <i>Tauraco schalowi</i>	GREY TOURACO <i>Corythaixoides c. concolor</i>	GOLD-COAST TOURACO <i>Tauracus p. persa</i>
Development at	25 days—Larger chick out of nest (first time). 28 days—Second chick seen out of nest for first time. 29 days—Green plumage coming through on the backs of both chicks. Both now moving strongly around inside quarters. 43 days—Chicks feeding themselves. 53 days—Chicks separated from the parents. Great difference in size between them.	33 days—Chicks eating hawthorn leaves. 35 days—Chicks eating whole orange. 41 days—Chick begging food from adult. 45 days—Alarm call attempted by chick. 47 days—Chicks now self-supporting, removed from parents aviary.	25 days—Crimson on flight feathers just starting to show. Crest quills about $\frac{3}{16}$ in. long. Coloured nodules appearing around eyes. Iris becoming lighter. 43 days—Bill becoming lighter, eye still very dark—green plumage coming through. Eye wattle very dark red. 102 days—Bill blackish red, eye wattle dull red, eye still darker than adult. Lower white eye stripe not as pronounced as in adult—has adult greater wing coverts. Has moulted out half of juvenile flight feathers. Green area on back not so great as that of adults.

NOTES ON THE TOURMALINE SUNANGEL HUMMINGBIRD

By A. J. MOBBS (Walsall, England)

The Tourmaline Sunangel, *Helianthus exortis*, can be found in the temperate zone of the Western and Central Andes, subtropical zone of the Eastern Andes of Colombia and of Eastern Ecuador (Peters 1945).

The male is a predominantly dark green bird. The upper parts are not iridescent, the feathers do have a shine to them, however. The chest and forehead are iridescent; chin and upper throat glittering violet-blue; lower throat glittering red, appearing as pink in certain lights. The tail which is long and deeply forked, has outer feathers of black and the central pair bronzy green. The primaries are also deep black. The vent and undertail coverts are white (adding greatly to the beauty of this species); here are also white ocular patches.

The female is also a dark green bird with a white chin and throat. The tail is shorter than in the male and not so deeply forked.

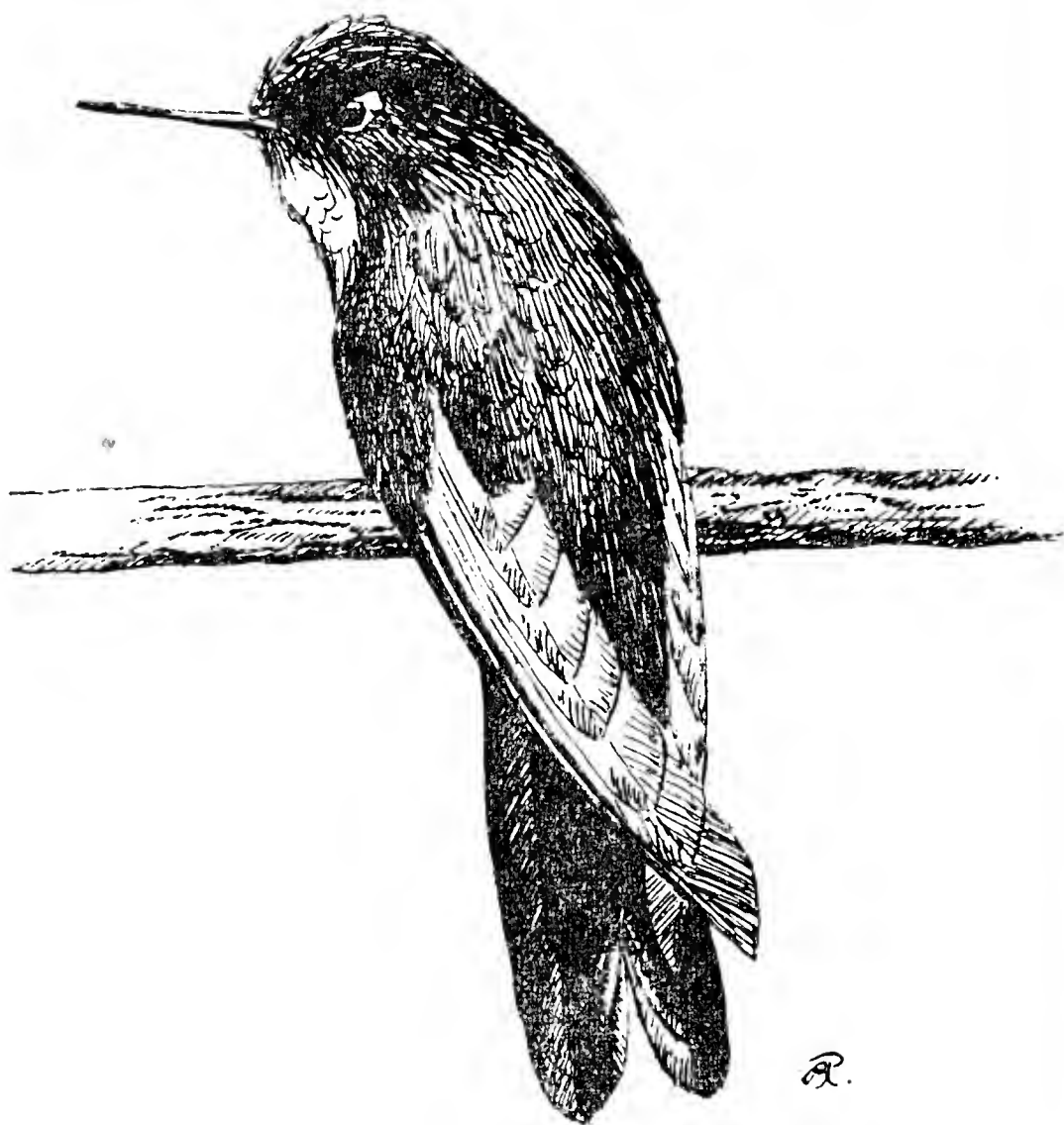
The male in my collection, is one of the few hummingbirds I have purchased which has not been a new import. It had in fact been in the country 17 months before it came into my possession. I first saw this bird at my importer-friend's establishment, where it was housed with an assorted batch of hummers, newly arrived from Ecuador. As well as this male, there were two other males and one female.

Although I was very taken with the species, all the Sunangels in the consignment appeared to be extremely belligerent and because of this, decided against purchasing one.

The male which is now in my collection, was originally sold to a person who housed it in a cage in his lounge. These conditions were far from ideal, partly because the bird received no live food. As this was the only bird owned by this person at the time, he soon grew tired of it and eventually it was sold to a friend who kept a mixed collection of exotics, which included two or three hummingbirds. It was from this person that I acquired the Sunangel.

I have given a brief history of the bird in question, mainly because the species is considered by many to be a difficult one to keep alive in confinement for any length of time. In fact of the four which originally came in, the male now in my collection is the sole survivor.

A friend of mine who is usually most successful with hummingbirds, has had no luck with this species. The first Sunangel he acquired, died within two months, the second and third died within a matter of days. They were in seemingly good health at the time of death. Other friends of mine have had reasonable success with this species, but none of the birds have lived more than four months, even when housed under seemingly ideal conditions. It is therefore, all the more surprising that the male now



Sketch of Male Tourmaline Sunangel when first purchased, showing abnormal colouring of white primaries and white patches on tail feathers, resulting from incorrect feeding.

in my collection, survived when the conditions in which it was housed could not be classed as suitable for even the most robust of hummingbird species. There is a possibility that this male holds the longevity record for the species in this country.

When I purchased the Sunangel, most of its primaries were white or near white. There were also white patches in the outer tail feathers. I put this down to the bird receiving little or no live food during the period of the moult. As it happened, I purchased the bird just at the right moment, as within twelve days it had commenced to moult. In hummingbirds, it is usually the primaries which are the first to go and I had had this bird so short a time, I would not have been surprised if the first feathers to be shed had grown in abnormally coloured. I always have an abundance of fruit-flies and the Sunangel took these avidly. The moment it was released into my communal hummingbird flight. The moult took ten weeks and when completed, the birds' plumage was immaculate and was the correct colour throughout.

This bird has continued to take large numbers of fruit-flies each day and has proved to be the most insectivorous species I have so far owned.

I have mentioned earlier that this species can be most belligerent. Other hummingbird enthusiasts who have owned Sunangels, will I feel sure, be in agreement with this. It was therefore with some perturbation that I released the Sunangel into my hummingbird flight. The bird was obviously not in the best of health as not only had it moulted incorrectly, it was also very much underweight. Perhaps this helped somewhat with the introduction to the flight, even so the Sunangel did show aggression to certain species. Two birds which helped keep the Sunangel "in its place" as a male Velvet-purple Coronet, *Boissonneaua jardini*, and a male Sapphire-vented Puffleg, *Eriocnemis luciani*. The former would most probably have ignored the Sunangel but for its abnormal plumage. This presumption is based on the fact that the Coronet attacked the Sunangel only when the latter was flying. At such times, the Sunangel showed large areas of white against what was otherwise a predominantly dark green bird. I have been unable to house White-necked Jacobins, *Corisuga mellivora*, or Black Jacobins, *Melanotrochilus fuscus*, with the Coronet, because of the predominantly black and white plumage of these species. Once the Sunangel had shed the white feathering, the Coronet ignored it completely.

The Sapphire-vented Puffleg and the Sunangel disliked each other on sight and will obviously continue to do so for the remainder of their lives. At first the Sunangel, being the newcomer to an already well established collection, was wary of the Puffleg and there were times when I feared the former would have to be removed from the flight. However, over a period of a few months, there developed a pattern of behaviour which appears to satisfy both birds. During the morning period, the Sunangel is the dominant of the two and does on occasions show extreme aggression towards the Puffleg. From around mid-day to 3 p.m. is always a quiet period as most of the hummers are at rest. After this quiet period and until roosting time (10 p.m.), the Puffleg becomes the dominant character and it is this bird's turn to show extreme aggression towards the Sunangel.

Species from the genera *Helianthus* and *Eriocnemis*, appear to be very much alike in many ways. For example the Tourmaline Sunangel and the Glowing Puffleg, *E. vestitus*, are very similar. Both species being predominantly dark green, with patches of highly iridescent plumage. Perhaps I should point out that this applies to males only; female Sunangels having white in their makeup). The shape of these species is also similar. I mention this as there is a possibility that the aggression shown is due to this similarity. This is most certainly the case where such species as Amazilias and certain species of Sapphires (both *Procharis* and *Chrysuronia*) are concerned.

The Tourmaline Sunangel is extremely vocal (this is where it differs greatly from the *Eriocnemis*, as birds from this genus appear to be silent), its song can be heard many times throughout the day. The song

consists of one note—Zzzzzt—which is repeated three or four times, when there is a slight pause before the note is again repeated. When showing aggression, the Sunangel uses this same note but it is more harsh, also the beautiful iridescent throat patch is thrust out more than it is during the normal-type song.

During quiet periods this hummer will perch on one leg and puff out its feathers, giving the appearance of being ill. While in this position, it will on occasions, sing a subdued version of the normal-type song. As the bird dozes, so the song is repeated less frequently until eventually the bird becomes silent. It needs only a slight disturbance, however, for the Sunangel to commence singing again.

I have found many species of birds kept in captivity, are encouraged to sing when music or such sounds as boiling kettles or vacuum-cleaners are heard. The sunbirds in my collection sing exuberantly when my wife is using the vacuum-cleaner in the hallway outside the birdroom. I mention this inducement to sing because until I purchased the Sunangel, I had not been aware hummingbirds could also be induced to sing. The Tourmaline Sunangel, although perhaps not so ready to break into song as the sunbirds, nevertheless is induced to sing when hearing prolonged bouts of music, etc. One sound in particular which never fails to persuade this hummer to sing is that of a scrubbing brush being run over the wire-mesh of the flight.

In a letter which appeared in the correspondence column of this magazine (1971), I gave a list of hummingbird species which I had observed indulging the habit of resting on one foot. This list did not include the *Heliangelus*, as at the time I had not owned a member of this genus. After careful observation of the male *exortis* in my collection and through correspondence with other hummingbird enthusiasts, I feel it is safe to say the Tourmaline Sunangel spends more time resting on one foot than any other species I have so far studied.

Although either foot can be used for gripping the perch, it appears the right foot is the most favoured. As with the *Boissonneaua*, I have yet to see the Sunangel actually roosting while gripping the perch with one foot.

With certain species of hummingbirds, it is often difficult to decide where aggressive attitudes end and mating display begins. This is particularly so with the Tourmaline Sunangel. As already mentioned, when showing aggression this species does utter a more harsh note than in the normal-type song, also the throat-patch is more pronounced. When showing aggression, the bird will hold its body sideways along the perch, with the wings hanging loosely to the sides and the tail feathers fanned. If this show of aggression is not enough to route the bird from which it is being directed, the Sunangel will become most agitated and will leave the perch and bombard its unfortunate "victim" from all directions. The Sunangel will on occasions force, its "victim" to leave the perch by pecking at its vent.

As mentioned, the mating display of the Sunangel is very much the same as the aggressive display. There is a possibility, however, that I do not witness the entire mating display of this species, as although my hummingbird flight is 18 ft. long, it is only 2 ft. 6 ins. wide, and this could limit the bird's actions somewhat.

The pronounced wing-action of this species is used each time the bird alights. Although not so exaggerated as that of the Coronet Hummingbirds (Mobbs 1972), this wing-action is nevertheless most noticeable. The Coronets hold their wings erect each time they alight; the wings are then brought down abruptly and folded into the resting position. The Sunangels, upon alighting, hold their wings horizontal and move them two or three times before folding them into the resting position. This action is more leisurely than it is in the Coronets and the wings are held much more loosely.

The wing-action of the Tourmaline Sunangel is very much in evidence prior to the mating display. At such times the bird will continually flick its wings, it will also open and close its tail feathers continually.

Until I purchased the Sunangel, I had always looked upon the Sapphire-vented Puffleg as being the most prolific bather of the hummingbird species I had so far owned. I now consider the Sunangel to be equally fond of bathing—yet another similarity between the species. As well as taking at least five or six baths daily, the Sunangel also drinks a certain amount of water. In fact each morning as soon as the birdroom lights are turned on, the Sunangel goes down to the bathing saucers to drink before taking nectar. It can be seen taking water from these saucers many times throughout the day also. Many hummingbird species take water regularly, but I have witnessed the following species only, take water before nectar each morning: Sapphire-vented Puffleg, Glowing Puffleg and Rainbow-bearded Thornbill, *Chalcostigma herrani*.

ACKNOWLEDGEMENT

I would like to thank Ber van Perlo (Odijk, Holland), for the sketch of the Tourmaline Sunangel.

REFERENCES

- MOBBS, A. J. 1971 (Letter). *Avicult. Mag.*, 77: 231.
MOBBS, A. J. 1972. The Coronet Hummingbirds, *Avicult. Mag.*, 78: 137-141.

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BREEDING FLAMINGOS AT SLIMBRIDGE

By T. S. JOHNSTONE (Stroud, Glos., England)

Aviculturally perhaps the greatest success at Slimbridge during the last decade has been with the flamingos.

Before the first birds arrived, I was given the opportunity to visit those establishments in Europe and America that had been successful in breeding flamingos. My object was to gain information about their husbandry particularly with regard to their diet, environment and colour preservation. With this information, a lot of uncanny 'knowhow' from the H.O. Director, and a deal of experiment a system was evolved.

Starting with twenty Chilean Flamingos in 1961, the number was in the autumn of 1972 over three hundred birds of all six forms as follows:-

41 Greater flamingos (<i>Phoenicopterus ruber roseus</i>)	12 reared at N.Gd
63 Rosy flamingos (<i>Phoenicopterus ruber ruber</i>)	8 reared at N.Gd
122 Chilean flamingos (<i>Phoenicopterus chilensis</i>)	55 reared at N.Gd
22 Andean flamingos (<i>Phoenicoparrus andinus</i>)	2 reared at N.Gd
19 James flamingos (<i>Phoenicoparrus jamesi</i>)	
45 Lesser flamingos (<i>Phoeniconaias minor</i>)	

The first breeding was that of the Caribbean in 1969 and since the time 77 young of four forms have been reared. The only species that has yet to lay is the James's.

The object of the exercise was to keep as large flocks as possible in extensive surroundings as possible and to maintain the birds natural colour. We felt that these factors together with suitable winter quarters might well result in breeding flamingos for the first time in Great Britain.

The diet eventually evolved is a meal made up by milling equal quantities of wheat, maize, poultry biscuit, turkey starter crumbs, dried shrimp and fish meal. The meal is mixed with water to a consistency of a thick soup. Minced lettuce, carrot and beetroot are added when available and the soup is medicated with Tylan as a precaution against respiratory diseases, to which James's Flamingo seems to be particularly prone.

Inasmuch as the breeding pairs of birds have been those in the best colour and that the colour is rapidly lost when the young birds are being fed, it would seem fair to assume that colour preservation in captive flamingos is a factor that facilitates successful breeding. Consequently the effect of various additives to the feed on plumage was examined over the first few years. It was found that the pigment canthaxanthine was the most satisfactory and this together with the milk product Rhodophos are fed each morning mixed into the normal diet. A visit to Slimbridge will show how effective this method has been.

The various forms are segregated into groups as they would be in the wild. Apart from the Greater and Lesser flamingos which occur together

naturally, and plans are in hand to segregate these for breeding purposes, the races are in separate pens and apart from the James's have comparatively large areas of water and mud over which to wander.

A great deal of trouble has gone into providing suitable nesting-sites for the birds, and each flock has been provided with a carefully constructed 'Atoll'. To visitors these appear to be just a mud flat showing above the water level. First of all the pond has to be drained and the mud removed. Tons of hard core are then tipped onto the site of the island to form a large oval, the edges of which, are brought up to within two ins. of the water level. Concrete is then laid at an angle of 30° over this ridge and as a causeway from the ridge to the feeding places on the banks of the pond. At the narrow ends of the oval the ridge dips to below water level in order to allow water to flow through the middle of the island. Apart from the central channel the whole area inside the ridge is filled up with a mixture of mud and sea-sand to some four ins. above the water. It is essential that the water be kept at such a level as to keep the mud in a consistency that the birds can build their nesting mounds without fear of them disintegrating during the laying or incubating periods. Concrete nests have been built and are quite satisfactory provided they are raised up from the hard core to above the mud surface. Suitability of the building material does seem to be of great importance. At New Grounds, where the soil is heavy clay that bakes hard in the sun, one noted that after a shower of rain during the summer, great building activity would commence with softened mud. Assessing the amount of mud necessary for the flock is difficult as it is not practical to add to it during the nest building activity. The nests are in the shape of flat topped cones some 12 ins. diameter at the base and 12-15 ins. at the top. The height varies from nine to eighteen inches. When there are 20 or 30 nests this amount of mud pulled up into heaps usually results in the nests being surrounded with water and as the building continues for most of the incubation period (28-32 days) in some cases the birds have found difficulty in collecting enough mud with which to carry on.

Although flamingos seem able to survive in quite low temperatures, it has been my experience that they are utterly miserable when left out in frost and snow of a Severn Valley winter. The fear of the birds getting frozen in and the subsequent breaking of the tarsi when endeavouring to release meant that something had to be done for the birds winter comfort. I therefore built large winter houses over existing water courses. Each house had to be close to a public foot-path and the side of the building adjacent to the path had to be a continuous window (for the benefit of winter visitors). Strip lighting and infra-red heating are provided. The floor is of concrete rendered in cement and sloping at an angle of 30° above the water. Considerable difficulty was experienced in providing a suitable surface, for the soles of the birds feet did not take kindly to the cement. Peat, sand, sawdust and straw were tried, but each of these

became foul so quickly as to be impractical. Rubberised paint seemed at first to be the solution. It was however found that the daily hosing and brushing down destroyed the paint in a relatively short time. Finally the floors have been covered with thin rubber sheeting which can be easily removed or left in situ for washing purposes. In each house there is a door over the water course and a small run adjoining so that the birds can be let out on warm winter days.

After caring for flamingos for ten years, I feel the following observations may be of interest to keepers of these interesting birds.

All species have been found to be easy to herd in and out of their houses, always provided the exercise is carried out tentatively, and that a recalcitrant bird is not chased. Any plan that can be evolved to avoid catching and handling should be pursued. Handling a number of birds usually results in one of them getting a tibio-tarsal joint damaged with inevitable fatal results. This policy means that the birds should be pinioned on arrival. In our case, the birds have been feather-cut on arrival and pinioned later on; but I think that immediate pinioning would probably be safer. Of course in the Autumn, we have had to catch the juveniles reared in the Summer for this purpose. In the last season experiments have been made in pinioning the day old chicks on the nest which has been tried with the Greaters and the Chilean. In the case of the former it was simplicity itself; one merely lifted the parent's wing took the chick, performed the necessary operation, and replaced it. No so with the Chilean. These would all leave the young and one had time to pinion some, but there was a distinct possibility that the downies having been handled would not stay in the nest, but would try to follow the parents and one had the fear that when the parent returned, the baby would not be able to climb back to safety.

It will be seen from the above that it has been found that the six species of flamingos differ considerably in temperament. The Caribbean, which are overlooked by the tea terraces and restaurant are the most apprehensive. When the first member of the staff arrives in the morning, although separated by a considerable stretch of water, the birds, even when nesting will get up and rush to the farthest point. However as the day progresses they recover and by the afternoon are quite oblivious of the many visitors photographing them.

This initial apprehension does not occur with their cousins the Greater Flamingos, for while they are laying and incubating, it is possible to walk about amongst the nests and to put one's hand under an immovable bird in fact on being approached a vacant nest will bring the bird back to defend it. Of course the fact that they are so gallant in defence of their nests does not mean that they should be disturbed any more than is necessary for the pinioning of the downies.

The Chilean behave midway between the Greaters and the Caribbean. The feeder can approach within a few feet of an incubating bird, but the

nest will not be defended and a further advance results in the adults leaving both eggs and young to the mercy of the intruder.

The Lesser Flamingo would appear to react as the Chilean, though as we have had no young so far, the behaviour has yet to be observed.

The most phlegmatic are the two species from the High Andes, the Andean, have a pen where their nesting atoll is within a yard of the public albeit separated by a fence. Furthermore it is the end of the island nearest to the public where the first nests are built.

The James's are in a pen through which the main pathway passes and the birds like to roost on the tarmac surface. Here, very often, visitors have to walk round them, obviously they get chivvied back on to the water.

Whilst it is believed that the chances of breeding flamingos is increased by having large flocks, it is interesting to note that the Andean at New Grounds number twenty birds and that as many as seven females have laid in one year. A further point of interest is that only one pair have produced fertile eggs. It was wondered whether this was due to the difficulty for a pinioned male to balance himself properly during copulation and it was proposed to feather cut the unpinioned wing to help with this difficulty. Nevertheless as stated before over seventy flamingos have been reared all by pinioned birds.

The normal number of eggs laid is one. On several occasions there have been two eggs in a nest and in one case three eggs. In these cases has been the fact that two or three birds have laid the eggs.

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THE EATING OF MEAT BY PARROTS

By D. H. S. RISDON (Rode, Somerset, England)

There is a tradition among Aviculturists that parrots are vegetarians and that the eating of meat or any animal food will, among other things, cause them to pluck their feathers. Nevertheless the relish with which they eat meat points to a decided need for animal protein, certainly among the larger parrots.

The first time this came to my notice was at the old Keston Foreign Bird Farm before the war when we bred Blue Fronted Amazons. The breeding pair came from the late Duke of Bedford's collection where they had hatched young on several occasions and, if I remember rightly, the chicks always died at an early age.

The Duke was a stickler for a vegetarian diet for parrots. I think the birds were only given the usual seed, nuts, greenfood and fruit. When they came to Keston, the late Mr. E. J. Boosey decided to supply them with more bulk in their food when they hatched young, so they were given boiled white fish, scrambled egg, boiled potato and rice pudding made with milk. This they consumed eagerly and reared five beautiful young

and I can remember to this day the excitement of looking into a nest box chock full of baby parrots.

Since we came to Rode, we have noted repeated cases of meat eating among our macaws and cockatoos. This first started when our macaws began to breed. Remembering what happened at Keston, as soon as young were hatched the parents were offered extras in the way of bread and butter, and soaked biscuit as well as chop bones and trimmings off the joint which they consumed avidly. Incidentally the meat is always cooked; they do not seem to like it raw, but they will eat raw sprats holding them in one foot and greedily munching them from head to tail as if they were eating a banana.

Our liberty macaws will descend on the bird food trolley as it goes round the grounds in the morning and besides helping themselves to fruit, readily take sprats and meat intended for the aviary birds.

If given a piece of bread liberally spread with butter, they will carefully lick off all the butter before eating the bread. They also prefer shortbread biscuit to other kinds of biscuit presumably because of its higher fat content.

The smaller parrots do not seem so keen on meat. This may be mainly because they do not recognise it as food, but the larger cockatoos like Moluccans and Sulphur Crested are equally keen on meat and fish.

What intrigues me is where would parrots get such food in the wild? It could of course be a substitute for grubs. The beaks of parrots are certainly designed for gouging into rotten wood, possibly in search of these things, but they would have to find a great deal of this food to supply them with what they seem to need. I find it hard to imagine any parrot catching small active prey, although they might conceivably eat the eggs and young of other birds.

Certain it is, however, that they have a distinct liking for food of animal origin and eat it so greedily that one gets the impression that they are starving for it. The available literature on parrots in the wild only gives a general description of their feeding habits. We all know that they take grain, fruit, nuts, blossoms etc., but little seems to have been studied as to exactly what they do eat. Perhaps some of our overseas members who live in "parrot" country could enlighten us.

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ASPECTS OF A NEW TROPICAL HOUSE FOR BIRDS AT PADSTOW BIRD GARDENS

By RICHARD MARK MARTIN (Curator, Padstow Bird Gardens,
Cornwall, England)

Towards the end of 1971 we began work on the largest and most important single development of these relatively new gardens—which were opened to the public at Whitsun 1970. The, as it transpired to be, accomplished intention was to have our new free-flight Tropical House open by Easter 1972. Our financial circumstances dictated that we did much of the work ourselves, only calling in specialists as and when necessary. This arrangement worked surprisingly well, and I think we discovered new and unexpected talents.

The main purpose of these notes is twofold: one is briefly to explain certain constructional details which I feel may be of interest and help to others considering similar undertakings, while the other concerns the establishing of plants and birds once the building was completed. That others may benefit from our mistakes and successes is, in my opinion, one of the justifications for our existence.

One conclusion which can be drawn straight away from our tropical house enterprise is that the cost of establishing this kind of near-perfect controlled habitat need not be nearly as prohibitive as one might think. By careful choice of materials, a little basic constructional knowledge and ability, a few extra pairs of hands from time to time and much hard work, a roomy, if not massive, house similar to ours can be constructed for a sum in the region of £2,000 to £3,000. This is inclusive of setting up the filter and heating system, and I have little doubt that most tropical houses cost very much more than this.

We were fortunate, admittedly, in being able to make use of some existing foundations and walls which to some extent governed the shape and size of the building. The area had been used long ago as a greenhouse and vegetable garden but all that remained were the very thick stone walls which measured about two feet wide. At the rear, the wall was some 11 ft. high but at the front it was only 7 ft. We decided to point and make good these walls, and at the front to add double-glazing—to effectively strengthen the wall to 11 ft. This we did and the result was to be a pleasantly high and well-lit enclosure. (The ground dimensions can be seen in the accompanying plan.)

We wanted a light yet strong roof with good heat insulation properties transparent enough not to hinder too much the passage of solar radiation; on the other hand we did not want a totally transparent material which would doubtless be a source of fright and frustration to birds housed therein. Eventually we plumped for a double skin of

Natural Translucent Filon supported by angled alum purlins, cross-tied for additional rigidity.

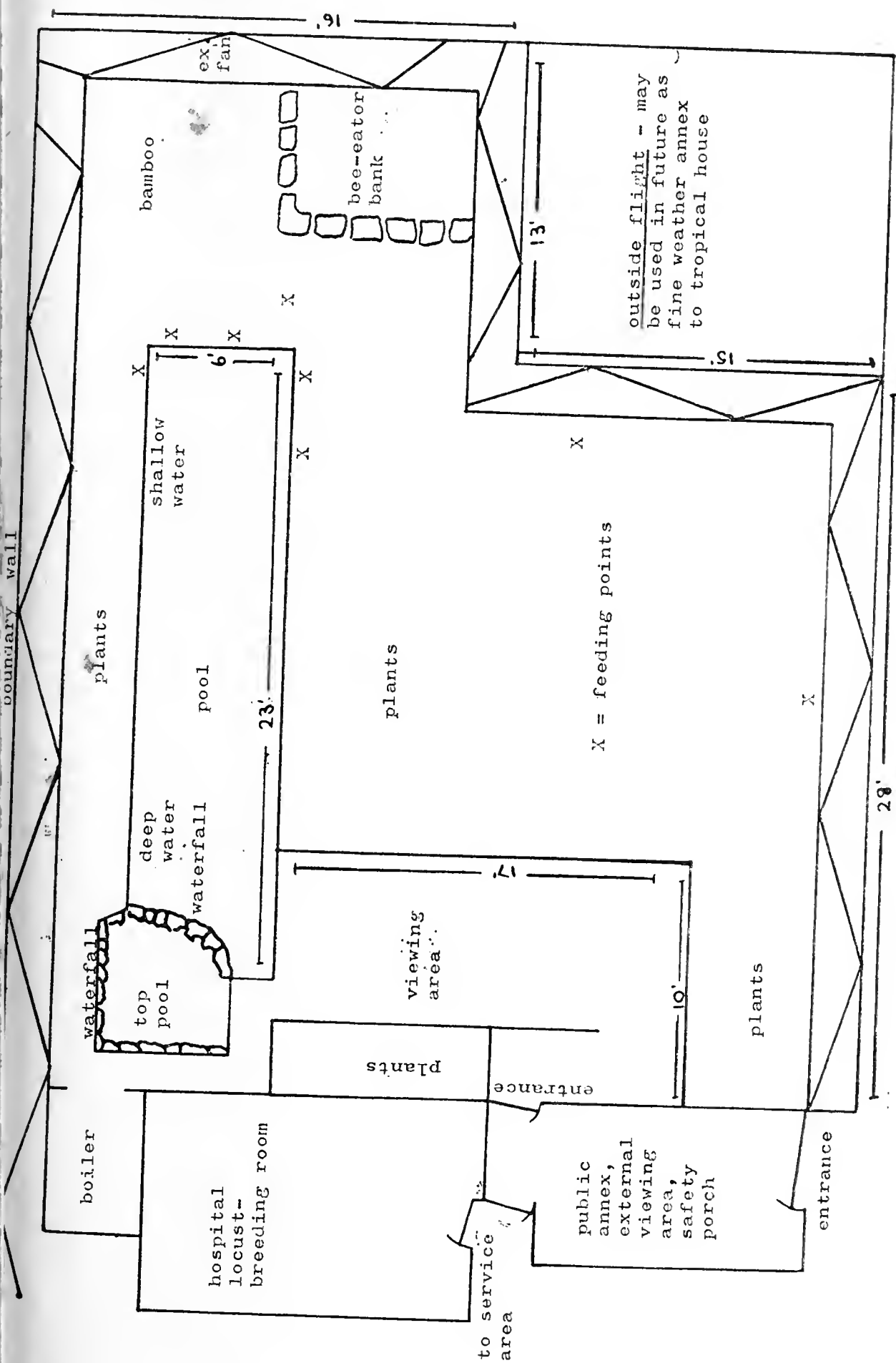
But before we could go ahead with all this, the actual ground which at that time resembled a scrap merchant's back-yard had to be cleared and cleaned up. The pond, which is such an important feature of a tropical house, was to be of a fairly simple shape mainly to facilitate the regular daily cleaning necessary in the temperatures applicable to a simulated sub-tropical habitat. I thought the plants and shrubs when established would help to conceal its rather blatant artificiality. In addition we constructed a shallow second pond at a higher level midway between a recirculating waterfall, operated by a submersible pump in the main water area, to a point some three feet above the higher pond. The idea behind this subsidiary pond, apart from aestheticism, was as a bathing and watering point for the more timid species, and the waterfall itself is appreciated by some, especially sunbirds.

It was decided, without much difficulty, to confine the public to one viewing area near the entrance. This type of arrangement is preferable to a walk-through system in any but the largest of houses as it minimises disturbance to what is the birds' territory, and thus improves breeding prospects and probably cuts losses through egg-stealing, nest-destroying and associated vandalism.

Probably the most intrinsic part of a tropical house situated in temperate country is the heating and ventilation system. We considered many ideas before choosing an Afos C7 solo air heater which incorporates piped water heating to help spread the output throughout the whole building—a total area of approximately 10,360 cu. ft. This is a highly versatile oil-fired boiler capable of many heating and ventilative tasks. One 12 in. three-speed extractor fan was situated at the opposite end of the building, but considering conditions experienced last summer, I feel we were wrong not to fit a second fan. On hot days, in spite of the fan working at maximum performance, the room temperature shot up alarmingly to in excess of 100°F at times, although I must admit that it affected the public more than the birds! Normally we endeavour to maintain temperature between 55 and 65°F through a room thermostat.

We took advantage of the heating facilities to locate an observation and locust-breeding room and hospital adjoining the Tropical House, from where we could keep a discreet eye on the birds (and public!). I was also keen to construct some nesting sites within the dividing wall—into which by virtue of glass panes we could observe and photograph any nesting activities. It is still too soon to say if these will be successful.

By the time the actual construction work was finished Easter was rapidly approaching. The next jobs were landscaping, perching and planting. The first thing we did was to build a high long bank of earth retained by large boulders at the far end of the flight, this we hoped would be used for nesting in by kingfishers and bee-eaters. The acquisition



plants, thanks to certain individuals and the Falmouth Parks Department did not prove difficult, and we soon had the soil prepared (by mixing in many bales of peat) and the planting accomplished.

The logs and branches brought in for landscaping and perching reason helped to compensate for the bareness of the obvious new enclosure. Even so, it looked little like the popular opinion of a jungle, and I was afraid that the plants would take years to get established while, in the meantime, the public would begin to mutter darkly. We needn't have worried. I fancy by maintaining a high humidity through regular spraying, and keeping the soil around the plants always moist, we encouraged rapid growth. Indeed, at the time of writing (January 1973), we have just finished a massive pruning and cutting back operation, as one or two of the plants were threatening to take over the entire building.

Especially vigorous and therefore to be recommended "tall plants" were *Cobaea scandens*, the passion flower, angel's trumpet, morning glory, Australian silk oak (*Grevillia robusta*), *Abutilon thompsonii*, jasmine, 'rubber plant' (*Ficus elastica*), *Fatsia japonica*, bougainvillea, monstera, *Clethra alnifolia* and perhaps surprisingly "busy lizzies"—which flourished from the outset and still are. Among the low-growing plants, the family nasturtium provided quick and efficient cover, and we have had to be quite ruthless with it; a huge begonia has been in flower constantly since last spring; amongst the others, *Crinum powellii*, a clivia and *Paspalum pitlalnifolia* have all done well.

The first of the avian inhabitants were to be a pair of Sunbitterns (*Eurypyga helias*)—who quickly made themselves at home and especially liked to skulk in a thick clump of bamboo which we had planted. Following on their heels was a consignment of excellent African birds from Tim and Jane Barnley in Kenya. Included in this consignment were Black-winged Stilts (*Himantopus h. himantopus*), African Jacanas (*Actophilornis africanus*), Woodland Kingfishers (*Halcyon senegalensis*), Tacazze and Malachite Sunbirds (*Nectarinia tacazze* and *N. famosa*) and a Collared Pratincole (*Glareola nuchalis*). Soon after these were established successfully we were able to add Green-backed Tits (*Parus monticolus*) from India, Zebra Doves (*Streptopelia striata*) and some Yellow-rumped Tanagers (*Ramphocelus icteronotus*).

By and large there were few acclimatisation problems. We were forced to remove a male Malachite Sunbird as the "true pair" of Tacazzes was preventing it from feeding, and I think it very likely that we will breed these in 1973 (at least I am hoping so!). We were unfortunate with our Green-backed Tits: one was killed, presumably by a Sunbittern, before it had learnt its way about, and a replacement hanged itself quite recently; this was a great shame as they were obviously content.

The Collared Pratincole, which was acclimatising nicely, was found one day, four months after its arrival, in the pond with severe brain damage. In spite of all our efforts it died the next day. I feel it likely that it fl

into one of the purlins (they definitely form a hazard), although one must not overlook the possibility of vandalism as it occurred in the middle of August. I have my doubts about the suitability of these birds to captive life as they are so obviously as much birds of the air as even the *Hirundines*.

This was the sum of our teething troubles, and, I think, does not reflect too badly. Our aim within the Tropical House is to house only the more compatible species, and for this reason have precluded members of the magpie family *Cracticidae* and other large omnivores. These get along admirably outside where they can have a flight to themselves, and I hope our future breeding results justify this policy.

We are also precluding flamingos, ibis and other relatively large andregarious water birds for hygienic reasons. Through past experiences know the difficulties of keeping the soil of indoor aviaries "sweet" in the face of such fierce competition!

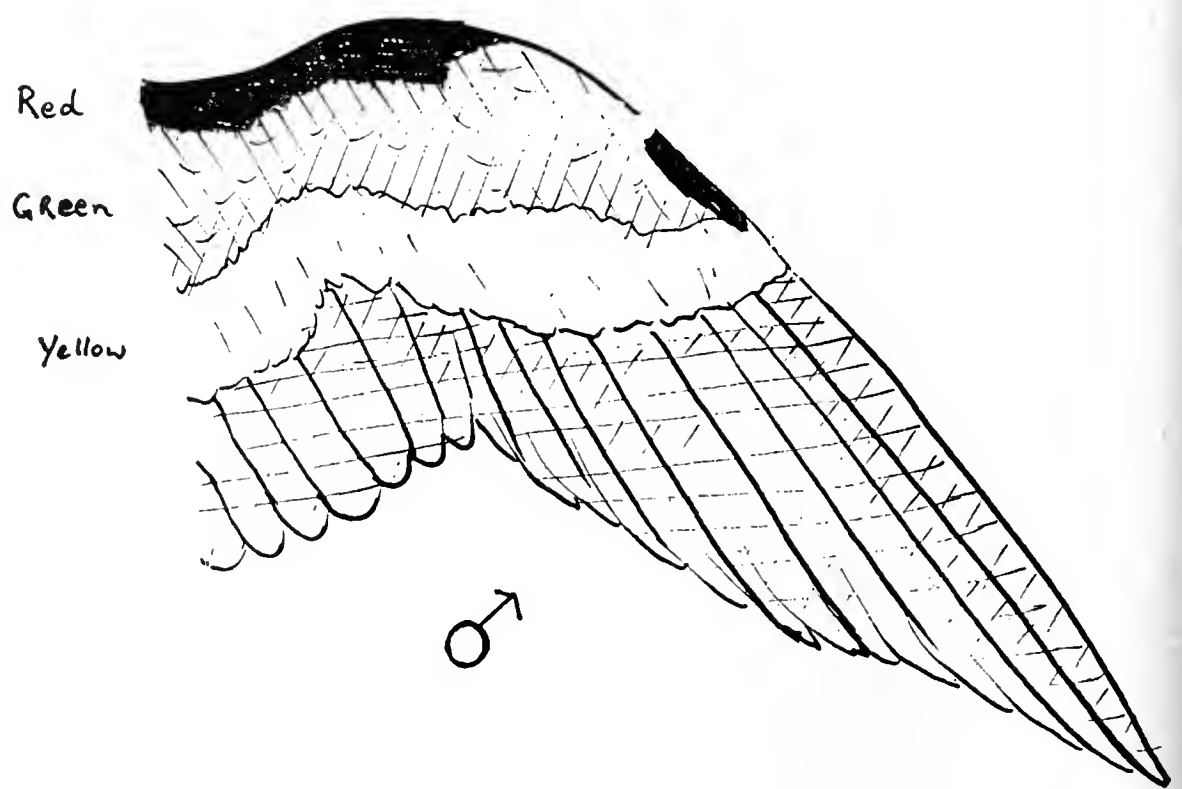
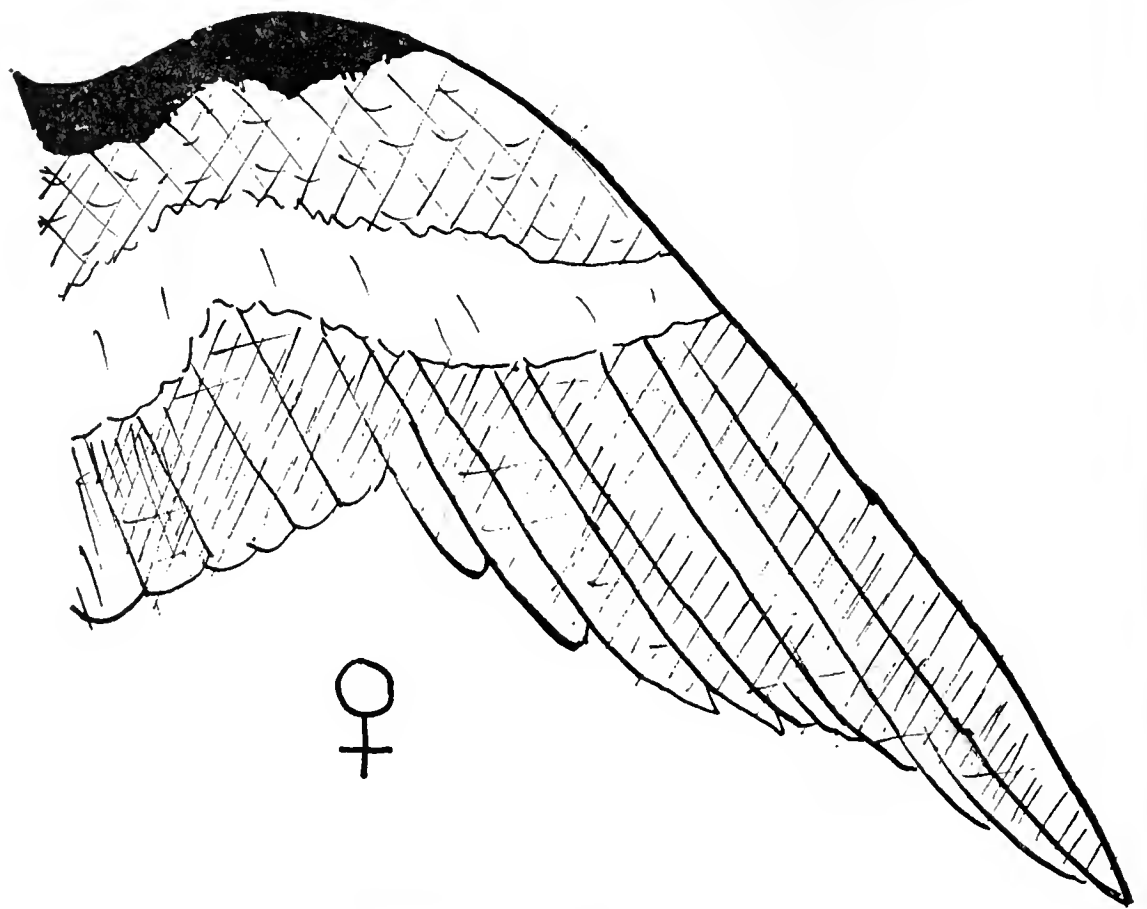
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A POSSIBLE METHOD OF SEXING THICK-BILLED PARROTS

(*Rhynchopsitta pachyrhyncha*)

By GEORGE A. SMITH (Peterborough, Northants, England)

Thick-billed Parrots are very large conures—about 1 ft. 3 ins. (38 cms.) long and with an average weight (15 individuals) of 300 g (over half a pound)—lowest weight 265 g, highest 330 g. A good, indeed the only, illustration of this macaw-like parrot that I know of occurs in the *AVICULTURAL MAGAZINE* 1927, p. 89. A rough description would be to imagine a heavy-headed, black-billed parrot of a uniform dulled green with the bend of the wing, face and thighs clearly marked with a deep blood-red. The tail not being quite as elongated as with many conures and macaws. Although it is not included by Greenway in his *Extinct and Vanishing Birds of the World* (1958), in *Extinct and Vanishing Animals* by V. Ziswiler (1967) nor in *The Red Book* by Fisher, Simon and Vincent (1969) it is, according to the *International Zoo Year Book*, listed as being an endangered species. Several Zoos now provide suitable accommodation for its breeding and it has been illustrated (where the artist has made it resemble a pigeon!) on the 2½ p. Jersey 'Wildlife in danger' series of postage stamps. It is possible that some confusion as to its rarity might have occurred because of a mix-up with the Maroon-fronted parrot, *R. (pachyrhyncha?)* *isi*, of which Blake, in his *Birds of Mexico* (1953), says 'unlike the Thick-billed Parrot this species is decidedly rare and occupies a very limited range'. The distribution of the Thick-billed Parrot is said to be over a large part of western and central Mexico where they are especially



Under-wing of Thick-billed parrot

characteristic of highland pine forests from Sierra Madre Occidental southwards over the central plateau to Michoacán occasionally being recorded as far east as Veracruz and as far north as Southern Arizona. Thick-billed Parrots subsist largely on pine seed—a wild crop—even though this seed has commercial value as *piñones* and because water attachment areas have increased value if afforested it might be thought to be reasonably safe from immediate extinction. The authorities in Mexico responsible for supervising exports of native birds seem not to regard it as needing protection for many (100+) have been recently imported into the U.K.. Breeding must continue in the wild for about a third of these exports, I am told, were juveniles with white streaks to the beaks. Recently I examined fifteen dead Thick-bills. Sexing neotropical parrots is not easy but a friend, on looking at these corpses, correctly picked out an adult male and female by the difference in boldness about the head and beak, though held his opinion about most of the others. The actual measurements of maximum beak widths, in millimetres was:

<i>Adult males</i>		<i>Immature males</i>	
<i>Upper bill</i>	<i>Lower bill</i>	<i>Upper bill</i>	<i>Lower bill</i>
18.5	23.0	17.9	20.9
18.9	23.0	18.0	23.0
19.0	21.5	18.0	23.5
19.5	23.8	18.8	20.5
20.5	23.8	18.8	22.5
		18.8	23.0
<i>Females</i>			
<i>Upper bill</i>	<i>Lower bill</i>		
17.2	20.0		
17.7	21.5		
17.8	21.8		
18.8	23.0		
19.5	23.5		

showing that most males have wider, and therefore bigger, bills than females but that this is not an invariable rule. There was one noticeable difference in the distribution of red feathering on the underside of the wing. In all ten males red feathers were found on the wings at the distal extremity of the 'hand'. Whereas of the females three had no red in this region on either wing and two hens, of which was the larger, had an odd red feather in a SINGLE wing

RECORDS OF BREEDINGS UNDER CONTROLLED CONDITIONS IN BRITAIN

PART 3

By C. J. O. HARRISON (Berkhamsted, Herts, England)

This is a continuation of the list of which two parts have already appeared—Pt. 1, Crows to Starlings, in vol. 78 (1972): pp. 169–172 and Pt. 2, Weavers and Waxbills, in vol. 78 (1972): pp. 205–209.

FINCHES. (*FRINGILLIDAE*).

EVENING GROSBEAK, *Coccothraustes vespertinus*. C. M. Payne. *A.M.* 6: (1956): 167–170.

HAWFINCH, *Coccothraustes coccothraustes*. W. E. Teschemaker. *A.M.* (3) 3 (1911–12): 28–34. *see also* A. A. Prestwich. *A.M.* 52 (1946) 224–225.

BULLFINCH, *Pyrrhula pyrrhula*. J. Sergeant. *A.M.* 1 (1894–5): 124.

RED-HEADED BULLFINCH, *Pyrrhula erythrocephala*. W. H. St. Quintin. *A.M.* (3) 8 (1916–17): 250.

CROSSBILL, *Loxia curvirostra*. A. Silver. (*per.* J. L. Bonhote). *A.M.* (3) 2 (1910–11): 109–117.

PINE GROSBEAK, *Pinicola enucleator*. W. H. St. Quintin. *A.M.* (2) (1906–7): 55–76.

PINK-BROWED ROSE-FINCH, *Carpodacus rhodopeplus*. W. H. St. Quintin. *A.M.* (3) 8 (1916–17): 251.

MEXICAN ROSE-FINCH, *Carpodacus mexicanus*. W. E. Teschemaker. *B.N.* (1) 1 (1910): 363. includes *C. m. frontalis*, House Finch. W. Shore Baily. *A.M.* (4) 3 (1925): 278–9.

PURPLE FINCH, *Carpodacus purpureus*. G. C. Lynch. *A.M.* 64 (1958) 137–139.

TRUMPETER BULLFINCH, *Rhodopechys githaginea*. E. G. B. Meade-Wald. in A. G. Butler, *Foreign birds for cage and aviary*. (c. 1906) 1: 9.

LINNET, *Acanthis cannabina*. W. T. Page. *B.N.* (2) 7 (1916): 19.

TWITE, *Acanthis flavirostris*. G. C. Swales. *A.M.* 1 (1895): 118.

REDPOLL, *Acanthis flammeus*. B. Carpenter. *A.M.* (2) 6 (1907–8) 160–161.

GOLDFINCH, *Carduelis carduelis*. R. Suggitt. *B.N.* 3 (1904): 70.

BLACK-HEADED SISKIN, *Spinus magellanicus*. W. E. Teschemaker. *B.N.* (2) 3 (1912): 4–9.

HOODED SISKIN, *Spinus cucullatus*. M. Amsler. *B.N.* (2) 3 (1912) 278–281.

SISKIN, *Spinus spinus*. W. T. Page. *B.N.* 8 (1909): 202.

HIMALAYAN GREENFINCH, *Carduelis spinoides*. W. Shore Baily. (3) (1919): 214. *also note in* (3) 3 (1920): 228.

- CHINESE GREENFINCH, *Carduelis sinica*. W. Shore Baily. *B.N.* (2) 6 (1915): 334-336.
- GREENFINCH, *Carduelis chloris*. J. Sergeant. *A.M.* 1 (1894-5): 124.
- BLACK-HEADED CANARY, *Alario alario*. H. R. Fillmer. *B.N.* 2 (1903-4): 30.
- TIBETAN SISKIN, *Spinus tibetanus*. W. E. Teschemaker. *B.N.* (2) 5 (1914): 278. See also *B.N.* (3) 2 (1919): 214-15.
- CITRIL FINCH, *Serinus citrinellus*. W. E. Teschemaker. *B.N.* (2) 4 (1913): 322.
- SERIN, *Serinus serinus*. G. C. Swales. *A.M.* 4 (1898): 14-15.
- PRIMSTONE CANARY, *Serinus sulphuratus*. W. Shore Baily. *A.M.* (2) 5 (1914): 264-5.
- YELLOW CANARY, *Serinus flaviventris*. W. Shore Baily. *A.M.* (4) 4 (1926): 328-329.
- GREEN SINGING FINCH, *Serinus mozambicus*. "I know it has been bred". E. Hopkinson, 1926.
- YELLOW-RUMPED SEEDEATER, *Serinus atrogularis*. W. E. Teschemaker. *A.M.* (2) 5 (1906-7): 198-200.
- WHITE-RUMPED SEEDEATER, GREY SINGING FINCH, *Serinus leucopygius*. Erskine Allen. *A.M.* 3 (1896-7): 147.
- RAMBLING, *Fringilla montifringilla*. R. Suggitt. *B.N.* (2) 8 (1917): 234-236.
- BLUE CHAFFINCH, *Fringilla teydea*. E. G. B. Meade-Waldo. *A.M.* 1 (1894-5): 103-104.
- CHAFFINCH, *Fringilla coelebs*. R. James. *A.M.* (5) 3 (1938): 142-143, 161.

TROUPIALS. (*ICTERIDAE*).

- BROWN-HEADED TROUPIAL, *Aegelaius ruficapillus*. W. Shore Baily. *B.N.* (3) 3 (1920): 159-162.
- RED-WINGED BLACKBIRD, *Aegelaius phoeniceus*. London Zoo. 1912, 1913. *L. Z. Repts.*
- YELLOW-HEADED MARSHBIRD, *Agelaius icterocephalus*. Keston Foreign Bird Farm. (E. J. Boosey). *A.M.* 62 (1956): 9-11.

BUNTINGS, GROSBEAKS AND TANAGERS. (*EMBERIZIDAE*).TANAGERS (*THRAUPINAE*).

- BLUE HONEYCREEPER, YELLOW-WINGED SUGARBIRD, *Cyanerpes cyanea*. Mrs. K. Drake. *A.M.* (4) 12 (1934): 219-220.
- PURPLE HONEYCREEPER, *Cyanerpes caeruleus*. London Zoo. J. Yealland. *A.M.* 74 (1968): 17-18.
- DR. WILSON'S TANAGER, *Tangara larvata*. J. A. Johnson. *A.M.* 71 (1965): 7.

- FAWN-NAPED TANAGER, *Tangara ruficervix*. H. Murray. *A.M.* (1970): 243.
- CAYENNE TANAGER, *Tangara cayana*. H. Murray. *A.M.* 67 (1961) 181-182.
- FESTIVE TANAGER, *Tangara cyanocephala*. Mrs. S. A. Pearse. *A.M.* (1962) 12: 220.
- THICK-BILLED TANAGER, *Euphonia lanirostris*. Jersey Zoo. *A.M.* (1971): 101-102.
- VIOLET TANAGER, *Euphonia violacea*. Mrs. K. Drake. *A.M.* (5) 2 (1937) 231-232.
- BLUE-SHOULDERED MOUNTAIN TANAGER, *Anisognathus flavinuchus*. Keston Foreign Bird Farm (W. D. Cummings). *A.M.* 69 (1963) 30-31.
- WHITE-CAPPED TANAGER, *Stephanophorus diadematus*. Mrs. K. M. Scamell. *A.M.* 71 (1965): 104-106.
- WESTERN PALM TANAGER, *Thraupis palmarum*. Lady Edith Pennant. *B.N.* (2) 3 (1912): 196.
- ORNATE TANAGER, *Thraupis ornata*. Duchess of Wellington. *A.M.* (1922) 13: 123.
- BLUE TANAGER, BISHOP TANAGER, *Thraupis episcopus*. Mrs. A. Speakman. *B.N.* (2) 6 (1915): 168, 260. Includes *T. e. cana* R. B. Abel. *A.M.* (4) 5 (1927): 323-324.
- LEMON-RUMPED TANAGER, *Ramphocelus flammigerus*. Mrs. K. M. Scamell. *A.M.* 76 (1970): 216-219.
- BRAZILIAN TANAGER, *Ramphocelus brasilius*. J. Easton Scott. *B.N.* (2) (1912): 153-155.
- CRIMSON-BACKED TANAGER, *Ramphocelus dimidiatus*. H. Murray. *A.M.* 74 (1968): 202-204.
- BLACK TANAGER, *Tachyphonus rufus*. W. E. Teschemaker. *A.M.* (2) (1905-6): 331-336. *B.N.* 6 (1907-8): 201-203.
- MAGPIE TANAGER, *Cissopis leveriana*. F. E. Thomas. *A.M.* (5) 3 (1938) 355-359.

CARDINALS AND GROSBEAKS. (*CARDINALINAE*).

- NONPAREIL BUNTING, *Passerina ciris*. C. D. Farrar. *A.M.* 5 (1898-9) 165-167.
- INDIGO BUNTING, *Passerina cyanea*. C. D. Farrar. *A.M.* 6 (1899-1900) 270-275.
- BLUE GROSBEAK, *Passerina (Guiraca) caerulea*. London Zoo. *L. Repts.* 1921.
- ULTRAMARINE GROSBEAK, *Passerina brissonii*. W. E. Teschemaker. *A.M.* (3) 1 (1909-1910): 64-65.
- GOLDEN-BILLED SALTATOR, *Saltator aurantirostris*. H. Bright. *B.N.* (1921) 4: 203-205.

- RED CARDINAL, *Cardinalis cardinalis*. C. D. Farrar. *A.M.* 5 (1898-9): 2-5, and H. D. Astley. *A.M.* 5 (1898-9): 5-7.
- BLACK-HEADED GROSBEAK, *Pheucticus melanocephalus*. W. E. Teschemaker. *B.N.* (2) 4 (1913): 7-9.
- ROSE-BREASTED GROSBEAK, *Pheucticus ludovicianus*. H. D. Astley. *A.M.* (3) 2 (1910-11): 333-337.
- YELLOW GROSBEAK, *Pheucticus chrysopheplus*. E. J. Brook. *A.M.* (3) 8 (1916-17): 28-29.
- BLACK-CISSEL, *Spiza americana*. W. E. Teschemaker. *B.N.* (2) 2 (1911): 268.

UNTINGS (EMBERIZINAE).

- YELLOW-BILLED CARDINAL, *Paroaria capitata*. M. Amsler. *A.M.* (3) 12 (1921): 160, and G. Rattigan. *A.M.* (3) 12 (1921): 133-135.
- BLACK-THROATED CARDINAL, *Paroaria gularis*. A. Ezra. *A.M.* (5) 2 (1937): 251.
- RED-CRESTED CARDINAL, *Paroaria coronata*. B. Hamilton-Scott, *per* W. T. Page. *B.N.* (2) 4 (1913): 285.
- RED-COWLED CARDINAL, *Paroaria dominicana*. Lady E. D. Pennant. *B.N.* (2) 3 (1912): 156-157.
- HEADED FINCH, *Coryphospingus pileatus*. Mrs. H. Williams. *A.M.* (2) 4 (1905-6): 30-34.
- GREEN CARDINAL, *Gubernatrix cristata*. C. D. Farrar. *A.M.* 3 (1896-7): 192.
- SPOTTED TOWHEE, *Pipilo maculatus*. C. M. Payne. *A.M.* 61 (1955): 224-226. (*P. m. oreganus* bred).
- BLACK-FACED GRASSQUIT, *Tiaris bicolor*. H. Wilford. *B.N.* (2) 1 (1910): 231.
- WHITE-THROATED FINCH, *Tiaris olivacea*. D. Seth-Smith, in A. G. Butler, *Foreign birds for cage and aviary* (c. 1906) pt. 1: 150.
- CRISP-BEAKED FINCH, *Tiaris canora*. L. W. Hawkins. *A.M.* 7 (1900-1): 29.
- BLACK SEED-FINCH, *Melopyrrha nigra*. W. Shore Baily. *B.N.* (2) 6 (1915): 219-222.
- WHITE-THROATED SEEDEATER, *Sporophila albigularis*. C. D. Farrar. *A.M.* (2) 3 (1904-5): 358-362.
- SPOTTED THROAT FINCH, *Sporophila nigricollis*. W. T. Page. *B.N.* (2) 3 (1912): 338.
- CRISP-BEAKED SEEDEATER, *Sporophila intermedia*. W. T. Page. *B.N.* (2) 3 (1912): 338.
- CRISP-BEAKED SEEDEATER, *Sporophila frontalis*. W. R. Partridge. *A.M.* 70 (1964): 111-113.
- CRISP-BEAKED GRASSQUIT, *Volatinia jacarini*. R. Suggitt. *B.N.* (2) 1 (1910): 363.
- CRISP-BEAKED YELLOW FINCH, *Sicalis luteola*.:— includes, Yellowish Finch, *S. l. arvensis*. D. Seth-Smith. *A.M.* (2) 4 (1905-6): 340-341.

- Yellow-bellied Finch, *S.l. luteiventris*. W. Shore Baily. *B.N.* (3) (1922): 179-181. Least Saffron Finch, *S. l. minor*. M. Amsler. *A.M.* (3) 7 (1915-16): 25-28.
- SAFFRON FINCH, *Sicalis flaveola*. Bred several times including, *B.N.* (1904): 247, *vide* E. Hopkinson, *Records of birds bred in captivity* (1926). Includes Pelzeln's Finch, *S. l. pezelni*. W. E. Teschemaker. *A.M.* (3) 1 (1909-10): 226.
- CHESTNUT-AND-BLACK WARBLING FINCH, *Poospiza nigrorufa*. A. Silver. *A.M.* (5) 3 (1938): 98-101.
- CINNAMON WARBLING FINCH, *Poospiza ornata*. Keston Foreign Bird Farm (W. D. Cummings). *A.M.* 66 (1960): 171-172.
- COMMON DUICA FINCH, *Duica duica*. London Zoo. *L. Z. Repts.* 1887.
- BLACK-CRESTED FINCH, *Lophospingus pusillus*. Mrs. P. R. Cholmeley. *A.M.* (5) 3 (1938): 274-275.
- MOURNING SIERRA-FINCH, *Phrygilus fruticeti*. M. Amsler. *B.N.* (2) (1915): 173-175.
- SLATE-COLOURED JUNCO, *Junco hyemalis*. London Zoo. *L. Z. Repts.* 1913.
- WHITE-CROWNED SPARROW, *Zonotrichia leucophrys*. London Zoo. *L. Z. Repts.* 1921. (*Z. l. gambeli* bred).
- HARRIS'S SPARROW, *Zonotrichia querula*. W. Shore Baily. *A.M.* (4) (1931): 252-254.
- RUFIOUS-COLLARED SPARROW, *Zonotrichia capensis*. W. E. Teschemaker. *A.M.* (2) 6 (1907-8): 26-30.
- SNOW BUNTING, *Plectrophenax nivalis*. G. T. Kay. *A.M.* (5) 9 (1944): 106-107.
- LAPLAND BUNTING, *Calcarius lapponicus*. W. E. Teschemaker. *via* E. Hopkinson. *A.M.* (4) 12 (1934): 512. (bred 1916, details said to be sent to Cage Birds at time).
- REED BUNTING, *Emberiza schoeniclus*. W. E. Teschemaker. *B.N.* (2) (1910): 308-309.
- GOLDEN-BREASTED BUNTING, *Emberiza flaviventris*. N. G. Allison. *A.M.* (5) 4 (1939): 314-317.
- YELLOW-BREASTED BUNTING, *Emberiza aureola*. Chester Zoo (W. H. Timmis). *A.M.* 78 (1972): 9-11.
- RED-HEADED BUNTING, *Emberiza bruniceps*. Chester Zoo (W. H. Timmis). *A.M.* 79 (1973): 3-7.
- CINNAMON-BREASTED ROCK BUNTING, *Emberiza tahapisi*. M. S. Aldham. *A.M.* (5) 2 (1937): 311-313.
- CIRL BUNTING, *Emberiza cirrus*. W. E. Teschemaker. *B.N.* 7 (1908-9): 145-148.
- YELLOWHAMMER, *Emberiza citrinella*. H. Willford. *B.N.* (2) 2 (1911): 238.

NEWS FROM THE BERLIN ZOO

By PROFESSOR DR. HEINZ-GEORG KLÖS

Again our breeding pair of European Eagle-Owls (*Bubo bubo*) hatched three fine chicks on 12th, 14th, and 16th March. The mother is well accustomed to people watching her closely and never feels disturbed during nesting time. So we are lucky in not having to provide her with straw-screen, and the Eagle-Owls are one of the very first spring attractions for the public every year.

The Black Swans (*Cygnus atratus*) fortunately got their young in a fairly late time in March. Usually these Australians hatch their young during their "natural" springtime, which means winter in Europe.

New arrivals:

3 Little Stints (*Calidris minuta*), 1 Common Thickknee (*Burhinus lunatus*), 2 Hammerkops (*Scopus umbretta*), 2 Bar-tailed Cuckoo Doves (*Coccyus zeylanicus*), 1 Kestrel (*Falco t. tinnunculus*), 1 Red-crested Catbird (*Catantopus moluccensis*), 2 Fischer's Lovebirds (*Agapornis fischeri*), 1 Quaker Parakeet (*Myopsittacus monachus*), 1 Black-headed Conure (*Aratinga canaryensis*), 1 Red-billed Hornbill (*Tockus erythrorhynchus*), 2 Yellow-bellied Leiothrix (*Leiothrix lutea*), 1,1 Orange-breasted Flowerpeckers (*Dicaeum trigonostigma*), 1 Masked Flower Piercer (*Diglossa baronina*), 0,1 Brasilia Hangnest (*Icterus jamaicii*), 5 Serins (*Serinus serinus*), 6 Siskins (*Carduelis spinus*), 5 Goldfinches (*Carduelis carduelis*), 1 Common Linnet (*Carduelis cannabina*), 1,1 Red-headed Finch (*Amadina melanoptera*), 1 Javan Hill Mynah (*Gracula r. religiosa*), 2 Rosy Pastors (*Myiophobus roseus*), 3 Indigo Buntings (*Passerina cyanea*), 4 Cedar Waxwings (*Bombus cedrorum*), 2 Bluish Seedeaters (*Sorophila albogularis*), 2 Great Finches (*Coryphospingus pileatus*), 0,1 Eastern Cardinal (*Carduelis cardinalis*), 1 White-throated Jay-Thrush (*Garrulax albogularis*), 1 Hunting Crow (*Cissa chinensis*), 2,2 Purple Finches (*Carpodacus p. boreus*), 2 Blue-winged Fruitsuckers (*Chloropsis hardwicki*), 2 Migratory Thrushes (*Turdus migratorius*), 2 Violet Tanagers (*Euphonia calceola*).

* * *

NEWS AND VIEWS

Two Takahes were hatched at the Mount Bruce Native Bird Reserve in New Zealand on Christmas Day 1972. This blue and green flightless species was believed to be extinct until 1948 when it was rediscovered in the mountainous, inhospitable country west of Lake Te Anau in the South Island. Fewer than 500 exist and every effort is being made at Mount Bruce to help conserve the species. Part of the conservation programme includes a determined attempt to breed the bird in captivity. Although wild caught chicks have been reared, and adults have nested before at Mount Bruce, this is the first occasion on which fertile eggs have been produced. I visited the Reserve in February of this year and was dismayed to learn that both the chicks had died because they had congenital abnormalities of the alimentary tract. However, the parent birds were making very good foster parents for a young Pukeko. As a parrakeet enthusiast I was very impressed by the success which the Reserve is having with parrakeets of the genus *Cyanoramphus*. Considerable numbers of the Yellow-fronted and Red-fronted species have been bred and, since my previous visit in 1969, several of the All Green Antipodes Island and the large Antipodes Island Red-crowned species. I believe that neither of these two members of the genus has been bred in captivity before.

* * *

It has been estimated that more than a hundred Amboina King Parrots of at least two different sub-species were imported in 1972. It is gratifying that most appear to have survived and several parrakeet breeders are now the proud possessors of potential breeding pairs. In this context it is interesting that although one of the sub-species has already been bred in this country the event was not well documented and appears to have escaped the notice of most people interested in parrakeet breeding. The successful rearing of a male and a female Salawati King took place in the late Duke of Bedford's Collection at Hayward's Heath when it was in the care of F. Gorman. The event is described very briefly in the Magazine of the Foreign Bird League (1940).

* * *

Since 1964, 25 Kea Parrots have been reared at the Zurich Zoo.

* * *

Breeding results 1972.

Mats Tell, Ljungbyhed:

"This season my parrakeets have been fairly successful and the following young were reared: five Stanleys, five Redrumps, one Manycoloured (which was reared by a pair of Stanleys), one Turquoise and eleven Bourke's. My Red Cardinals have four young which have now moulted into adult plumage; they proved to be two cocks and two hens and they are really magnificent birds. My softbills have failed. My old cock Silver-eared Mesia died after one day's illness and the hen of my second pair came into a heavy, and too early, moult. The hen Pekin Robin, which has been in my possession for nine years, would not lay although the pair had a complete nest. The Blue-winged Sivas had their first three eggs infertile and the newly-hatched chicks of their second clutch were immediately eaten by the female.

W. Langberg, Copenhagen: "I had young Pileated, Rock Peplar, Crimson-winged, Pennant's (the lesser red from North Australia), Princess of Wales, Blue Ring-necked and Blue-winged Parrakeets, Lutino and Pied Cockatiels, Spectacled Parrotlets and Cherry, Diggle's, Bicheno and Peale's Parrot-finches. The King Parrots had infertile eggs and the leadbeater's Cockatoos laid but would not sit."

E. Norgaard-Olesen, Janderup: "I bred one *Loriculus vernalis* and one *L. galgulus*. Several of my Tanagers had eggs but none succeeded."

Dr. L. F. Baptista: "Dr. Hans Löhrl, the director of the *Max Planck Institut für Verhaltenphysiologie Vogelwarte Radolfzell*, has twice bred the parrotbill (*Paradoxornis webbiana*). The first egg of the first clutch of six was laid on 12th May 1971. Three eggs were removed for protein studies and substituted with three flycatcher eggs so that the parrotbills could incubate a normal clutch size. Two Parrotbills hatched and were removed when seven days old and hand-reared in connection with Dr. Löhrl's behavioural studies. A second clutch of five was started on 13th June 1971. Three young hatched, two of which were raised to maturity by their parents. The eggs of a third clutch were removed. This is very likely a first breeding for the genus in captivity. Jean Delacour's breeding of *Paradoxornis fulvifrons* (AVICULTURAL MAGAZINE, 1973, 79, 18) is probably a second record for the genus. In 1971 Dr. Löhrl also bred the Wallcreeper (*Tichodroma muraria*). Two young were raised to maturity by their parents. The Wallcreepers are now on display at the Innsbruck Zoo. Some of the Parrotbills were sent to the Basel and Frankfurt Zoos.

E. Williams, Hambledon: "nine Splendid Parrakeets from four pairs, eight Turquoisines from three pairs, six Elegants from two pairs, five Bourke's from three pairs, one Golden-Mantled Rosella from two pairs and two Pennant's from two pairs. No Many-coloured were reared from three pairs and Blue-wings did not go to nest".

R. T. Kyme, Kirton: "four Weber's and one Edward's Lorrikeets three Mealy Rosella, four Stanley, five Turquoise, five Yellow Red-rump three Quaker and three Lutino Ring-necked Parrakeets. My Yellow-fronted New Zealand Parrakeets had five chicks which they let die—last year they reared some lovely birds. My Cape Parrots arrived too late in the season to breed. My latest arrivals are two pairs Iris Lorrikeets one pair Dusky Lories, one pair Yellow-streaked Lories, one pair Everett's Blue-backed Parrots and one pair of Blue-naped Mousebirds".

* * *

At Birdland, Bourton-on-the-Water a new Tropical House was officially opened on 26th September 1972. It provides another example of Le Hill's remarkable flair for designing enclosures which are both highly practical and very attractive. It accommodates in several different compartments Toucan Barbets, Narina Trogons, Renauld's Ground Cuckoo etc. as well as a superb collection of Bee-eaters most of which are the exquisite Carmine species.

J. R. H.

* * *

COUNCIL MEETING

A Council Meeting was held on 11th April, 1973, at the Linnean Society, London, W.1.

The following members were present:

Miss Phyllis Barclay-Smith (Vice-President), in the chair.

Mr. P. B. Brown, Mr. J. O. D'Eath, Mr. M. D. England, Dr. C. J. C. Harrison, Professor J. R. Hodges, Mr. F. Meaden, Mr. H. Murray, Mr. N. R. Steele, Mr. K. A. Norris, Mr. P. J. S. Olney.

Mr. H. J. Horswell (Hon. Secretary and Treasurer), Mrs. M. H. Haynes (Assistant Hon. Secretary).

CHANGE IN RULES

It was agreed that the procedure for electing new Members should be amended so that a Proposer was no longer needed. Rule 3(b) now reads as follows:—

"... that every applicant for admission as a Member of the Society must himself duly complete and sign the application for admission form. The name and address of every applicant shall be published in the next issue of the Magazine. Unless the applicant shall within four weeks after the publication of his name in the Magazine be objected to by at least two Members, he shall be deemed to be duly elected. If two or more Members shall object to any applicant the name of such

applicant shall be brought before the Council at their next Meeting, and the Council shall have power to elect or disqualify him from election."

ELECTIONS

Mr. A. A. Prestwich was elected an Honorary Vice President in recognition of his long service to the Society as Hon. Secretary and Treasurer, and founder of the British Aviculturists' Club.

Mr. J. Alastair Anderson, Captain W. Mountain and Captain H. S. Stokes were elected Honorary Life Members having belonged to the Society for fifty years. Council passed a vote of thanks for their long interest and support.

H. J. HORSWELL,
Hon. Secretary and Treasurer.

* * *

BRITISH AVICULTURISTS' CLUB

The one hundred and ninth Meeting of the Club was held on Wednesday, 11th April, 1973, at the Linnean Society, Burlington House, London, W.1. The following Members attended: Mrs. D. E. Balcon, W. Brain, O. D'Eath, E. H. Down, Miss W. Duggan, M. D. England, R. Grantham, J. O. Harrison, Mrs. M. Haynes, L. W. Hill, J. R. Hodges, H. J. Horswell, J. Jones, H. G. Kenyon, H. Murray, K. A. Norris (Chairman), N. O. Connor, B. Sayers, N. R. Steele.

Total attendance: 17 Members, 32 guests.

The Meeting started at 6.30 p.m. with a Wine and Cheese Party, followed by a film "The Baobab Tree" presented by Mr. Mike Kendall, Librarian of the BBC Natural History Unit, who gave a most interesting talk describing how the film was made. Our thanks are due to Mr. Kendall for giving the Members such an enjoyable evening.

* * *

Avicultural Society Members are reminded that they are entitled to attend one Meeting of the British Aviculturists' Club before deciding whether they would like to join. The subscription for membership is £10 p.a. per year.

We are always delighted to welcome overseas Members as guests at our functions—please let us know if you are coming to England in case your visit coincides with a Meeting.

MARY HAYNES,
Hon. Secretary.

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REVIEW

THE PARROTS OF SOUTH AMERICA. By ROSEMARY LOW.
London: John Gifford, 1972. Price £3.25p.

Although Central and South America contain the greater part of the world's parrot species, very little information has been available in the past, in spite of the amount written about the relatively smaller number of Australian species. With the shift of sources of bird imports over the years an increasing variety of American parrots have become available to the aviculturist, who at times has found it difficult to discover which species he had. Rosemary Low's book is therefore an important addition to parrot literature, as the only work specifically covering this region.

The book is written for the aviculturist and the text constantly reflects the author's considerable experience in the keeping of these birds. The opening chapters on purchase, accommodation, feeding, general care, and breeding contain a lot of good practical advice.

The parrots themselves are grouped in five chapters—headed Macaws, Conures, Parrakeets and Parrotlets, Small Parrots, and Amazons. This section brings out one shortcoming of the book. Some 144 species and their subspecies are involved, but there is no general key to the identification of the different types of South American parrots and their species groups. Those familiar with some of the birds may find this satisfactory, but the beginner with an unknown bird might need to work through most of the text to identify it. There is an identification key for the Amazon species, and something of this kind would have been a help elsewhere—with the *Pyrrhura* species for instance.

Each genus or natural group of smaller genera is introduced with a general text, differing considerably in length, seemingly related to the extent to which the birds are kept, but usually containing information on the suitability of the species as pets or aviary birds, and sometimes on their general keeping and breeding. Following this birds are dealt with as species and subspecies. The text for each, where sufficient information is available, includes alternative popular names, and a brief description of adult and immature birds. Distribution is given, varying from precise habitat data where available, to a brief statement of geographical region. This is followed by a section headed "remarks" which usually gives information on the extent to which the species has been imported and kept by aviculturists, together with various pieces of information, and quotations from published sources, of the general demeanour and needs of the birds; as well as any facts which are not covered by more specific headings. Finally there are sections on breeding results, with data on captive breedings.

The arrangement is a little difficult to follow at times owing to the treatment of subspecies. In recent revisions of parrot classification birds

which were earlier thought to be separate species have been grouped together under one name. In the present work species and subspecies are often listed with similar headings. Separate English names may be used in each case without a clear indication, other than in the abbreviated Latin name, as to which is involved. Some subspecies are, however, listed with only subsidiary headings, and a few with no indication of how they differ from the described forms. This may reflect the degree of cultural interest in the birds concerned, and from that viewpoint the arrangement may be satisfactory, but otherwise it does not commend itself. I feel that the species unit should have been more clearly indicated, and that the popular names for subspecies should have been less prominent. In the plates 42 species are illustrated by colour photographs. There is an appendix note on the taking of, such photographs; and one on abnormal plumage variations in these species. In spite of criticism the book is a useful and timely addition to avicultural literature.

C. J. O. H.

* * *

CORRESPONDENCE

HANGING PARROTS

My first recollection of Hanging Parrots was at a National Cage Bird show. The second time was in Singapore, on my first visit to three of the bird shops, where they each had a small number of Blue Crowned. The next time I saw this group was during this voyage at Goa, where we were visiting Iron Ore. It was on the second day there; a young man came on board with four Vernal's. At the time, I had no intention of acquiring any as my hopes were for Sunbirds or any insectivorous birds. One of the assistant stewards, who had some small parrot-like birds for his father, acquired them for a shirt. Later, through an Anglo-Indian boy, I found out they were to be had in town for as low as 50p. I have since found out at home they cost between £5 and £7 a pair, which is certainly a great contrast. Two more boys bought two each in the following days and the same Indian boy had six more the day we sailed for Japan. In Japan, I acquired five of them as their previous owners did not wish the birds to mess up their newly acquired electrical equipment. At the time of writing, I have had them for a month. In this time I have noticed that each has its own character. They sit for most of the day on top of the bell-like cage moving down to the dish, on which it stands, for food and water. Each morning when I uncover the dish, as I always put them in at night, the most nervous one is always the first out. It takes straight for the water which I have just put down. It proceeds to dip its head and breast, then climb up the cage to preen itself. Another makes for the dish, looks in and then up to the top of the cage. The other three remain quiet. Nothing more happens until I have left the cabin. On my return, about an hour later, they are all on the carpet with the exception of one which is always on its perch, as it can fly quite well. I feed them on sponge cake, which one can easily get on a ship, which has gone stale then soaked in diluted honey and a little fruit. This diet appears to be quite adequate as their droppings are soft, semi-solid and normal in appearance.

They do not seem to mind noise at all, even sudden ones, as I play my tape recorder when ever I get the opportunity at a reasonably good volume. They appear to like certain pieces more than others as they come to life even joining in with chirps and squeaks. Their voices are heard, at other times, only occasionally so they are the least offensive of parrots.

I would have liked to have kept these five, but being away at sea this is impossible. I have asked Mr. B. Reed, another of our members, if he can find a home for them. One of their habits, of which they have just reminded me, is the rubbing or scraping of the tongue on their bills giving quite a loud rasping sound. Why they do this I can only guess: to clean the tongue or the beak.

In his book Whistler says that, "iris yellowish white; bill coral red, tip yellow cere darker red", but in my five the bill is orange with a hint of red in two and the eye is completely dark. In the book the iris colour is clearly indicated in the monochrome illustration. Are my birds young ones and do these features change with age? Can any member more experienced with this group comment on the matter?

M.V. TREBARTHA
P & O GENERAL CARGO DIVISION.

ALAN BOOTH.

The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

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[Derek Washington

The abnormally coloured male House Sparrow showing the pale bill
and lighter brown regions of the head



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[Derek Washington

A normal male House Sparrow for comparison

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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JULY-AUGUST 1973

BREEDING THE HOUSE SPARROW

By DEREK WASHINGTON (East Grinstead, Sussex, England)

It would seem that no one has yet published an account of breeding House Sparrows *Passer domesticus* in captivity in Britain. This lack of information was brought to light by C. J. O. Harrison (AVICULTURAL MAGAZINE 77 (1971) 131-135 and 78 (1972) 205-209) and the second of his lists finally pricked my conscience and stimulated me to prepare these notes. The following account describes breeding attempts, some successful and some not, between the years 1967 and 1971. Further interest is added by the fact that the male parent was abnormally coloured, and that this abnormality was not inherited by any of the offspring, even when the male was paired back to his daughter.

Towards the end of 1966 I was given an unrelated pair of House Sparrows. The female was normal in colour, but the male was paler than normal. He showed all the markings of a male, but the colours were reduced in intensity giving an overall fawn appearance. The normally black bib, for example, was dark grey and the chestnut regions of the neck were light brown. The bill was a yellowish horn colour, even in summer when it should be black, and the eyes appeared red when viewed with a bright light directly behind the observer.

For convenience, I shall refer to this bird as dilute, though this may not be scientifically accurate. I am not certain of the origin of these birds but believe they were taken from the wild.

In 1967 they were kept in a large double breeder cage in my garden at Redhill in Surrey. They were given a Budgerigar nestbox, but made no attempts to use it. Food at this time (April) consisted of a mixed seed mixture up as follows:—2 parts British Finch mixture, 2 parts wild seeds, 1 part niger. Each bird consumed about 1½ teaspoons of the mixture daily. A good supply of maggots was always available, also wet apple and coltsfoot.

On 30th April I transferred the birds to an aviary measuring 12 ft. × 6 ft. × 7 ft. high. The rear wall was timber, covered on the inside with mats of heather. The rear 2½ ft. of roof was also timber to provide shelter. The aviary already contained one pair each of the following species:—Canary, Bullfinch, Greenfinch, Goldfinch, Siskin and Redpoll. Within minutes of their release in the aviary the male House Sparrow started chasing his female all over the place in a most excited manner.

Fresh wild seeding plants were given daily as they became available; for example in June I saw the House Sparrows eating chickweed, sow thistle and plantain. In spite of frequent chasing by the male no nesting activity was noticed until 6th June, when an attempt was made to build a nest high among the heather under the covered roof. There was very little material to act as foundation, so I fixed a Budgerigar nestbox at this spot. This suited the birds fine, though not in the way I expected. They built on top of the box, sandwiching their nest between it and the roof—a height of two to three inches. One result of this was that the nesting chamber had a hard wooden floor with no lining over it. The nest was rapidly constructed from dry grasses and some of the various plants which were offered to the birds as food, such as long stems of great plantain. A sparse lining of feathers was subsequently added.

The first egg appeared on 13th June, followed by three others at daily intervals. Incubation appeared to be by the female alone. On 25th June I noticed a sudden increase in the rate of maggot consumption, and assumed the eggs were hatching. On the following day I gingerly felt in the nest and found three chicks and an egg. This egg did not hatch and disappeared within the next two days. The Handbook gives an incubation period of 12 to 14 days, starting from the completion of the clutch. In the present case there were certainly young in the nest 10 days after the last egg was laid, and probably as soon as nine days after.

On 1st July I examined the nestlings. One had a deformed leg with the knee joint apparently working the wrong way round, so that the leg was pointed forwards towards the wing. At the time I wondered whether this might be a consequence of the very shallow nest with its hard wooden floor. The other two young were ringed with the recommended B.B.B.A rings, size B3. These would barely go on, although the young were probably only five or six days old. Later on the legs became much thicker and the soft fleshy surface bulged out over the rings. This worried me, and I managed to cut the rings off without harm to the birds. A bigger ring would not solve this problem as I had been able without difficulty to fit B3 rings on to the legs of both parents when they were adults. The House Sparrow is one of those species which exhibit "puppy fat", that is the legs of nestlings are thicker than those of adults. Some measurements of a subsequent brood showing this phenomenon are given later in the article. It seems likely that close rings are unsuitable for this species.

All three young appeared to have normally coloured skin with no trace of any pale features. They differed from the young of other species I was breeding, Greenfinches for example, in showing no traces of fluff down. They were simply bald and ugly, with a few quills beginning to push through.

By 7th July I was able to offer daily supplies of blackfly on stems of dock and thistle, but I did not notice the Sparrows eating these. The



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The nest in 1967

[Derek Washington



pyright]

Pale and normal eggs from the same clutch (1969)

[Derek Washington

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were nervous birds, however, and I continued with the blackfly in the hope that they were being taken after I left the aviary. On this day I found the chick with the deformed leg dead in the nest.

The remaining two young left the nest on 14th July. During the rest of the summer I gave supplies of all manner of wild seeds as these came into season. Both birds were successfully reared, and proved to be of each sex and normal in colour. Both had slightly deformed toes on each foot. I kept the female to pair back to her father, and released the male.

In 1968 I moved house from Redhill to East Grinstead in Sussex. The three Sparrows were caged in February whilst their aviary was dismantled. On 21st April they were released into their new aviary. This measured 12 ft. \times 9 ft. \times 7 ft. high, approximately 3 ft. of the rear wall was boarded from ground to roof and attached to a 3 ft. square boarded section of the roof. The rear of the aviary was heavily planted with evergreen shrubs and some elderberry bushes. The aviary contained three Budgerigar nestboxes and a tit nestbox of a type known as Upton permanent box (see British Trust for Ornithology Field Guide No. 3 "Nestboxes" by Edwin Cohen).

Other inhabitants of this new aviary were 10 finches of various species, Collared Dove, and a Black-headed Gull with only one wing. There were a few differences from the previous year in the food available. All foods were given dry, not soaked. Separate dishes contained British seed mixture, sunflower, peanuts, wheat, dove and pheasant mixture and wild seed mixture. Soft foods were also offered, again in separate dishes. These were soaked puppy biscuit, egg biscuit food and bread soaked in milk sprinkled with calcium phosphate. As many wild seedling plants were offered as possible, species varying according to the season. On 28th April the Upton permanent box contained some dead grass and the adult female Sparrow was seen to visit it. The male House Sparrow was very energetic, often displaying and chasing this, his original, mate. By 8th May a lot of material had been added to the nest and a large egg, mostly of seed fluff, was being added. Three days later I added a large supply of maggots to the diet.

On 18th May there were five eggs in the box, and the adult female was incubating. During the evening of the 25th I felt in the nest and the eggs were quite cool. I wondered if the hen had deserted, but on the following morning the rate of maggot consumption increased about four times, and on the following morning there were certainly young in the nest. That morning (30th May) there were four chicks and a clear egg. In spite of these difficulties I decided to ring these young with smaller than the recommended B3 rings (inside diameter=3 mm) this time using the smallest B2, as I knew the B3 ring could be fitted on to adults. By 4th June it looked as though there was another puppy fat problem, however, to prevent further constriction I cut through the rings with fine

wire cutters, subsequently pulling them open sufficiently for removal using two pairs of surgical forceps. I tried fitting the larger B₃ ring on this day, but it would not go on. Next day I put on plastic Budgerig split rings for identification. These were coloured green, blue, black and white.

On 7th June I measured the length of web open on the primary feathers as an indication of their stage of development. I also measured tarsus thickness to check on the puppy fat problem. The birds ringed black and white left the nest on 12th June, whilst Green and Blue fledged the day after. Further tarsus measurements were taken on 18th June, details are given in Table 1.

TABLE 1

Bird	7th June (probably nine days old)		18th June
	Length of web open on primaries	Tarsus thickness	Tarsus thickness
Green	5 mm	3.00 mm	2.60 mm
Black	9 mm	3.10 mm	2.75 mm
Blue	10 mm	3.00 mm	2.75 mm
White	12 mm	3.05 mm	2.95 mm

There was thus a reduction in tarsus thickness between the probable ages of 9 and 20 days of up to 0.4 mm. (Tarsus measurements were made to the nearest 0.05 mm using vernier calipers. Every effort was made to measure consistently to minimise experimental error). The results illustrate the puppy fat problem and give some measure of the difficulties faced when close ringing this species.

On 14th June, the day after the last young fledged, I noticed a drop in the rate of maggot consumption by about 30%; at the same time more bread and milk was being eaten. Two weeks later three of the young were seen feeding together on freshly gathered chickweed.

The young were all normal in colour.

All the Sparrows were nervous and would hide if they knew I was around. Sometimes though I could watch their behaviour from the house (about 80 ft. away) using binoculars. 16th June at about 11 a.m. was one such occasion when I watched the male and the breeding female mating. I did not see the start of this sequence, the unusual activity prompted me to fetch my binoculars. The female was on a sloping perch about two feet from the nest box, she was quivering her wings. The male flew round the aviary several times (clockwise if viewed from above) briefly pausing now and then on perches or on top of the nest box. He then quickly mounted the female from behind. During copulation she stopped quivering her wings, but the male flapped his vigorously as he tried to keep balance. They remained like this for only 2 or 3 seconds, then the male flew off for 5 to 10 seconds and returned and repeated the performance. This happened eight times in all. The female remained

tionary except once when she moved a couple of inches down the perch between matings. The female interrupted the sequence by flying away. Two days later the first egg of the second clutch was laid in the same nest. The nest contained two eggs on 20th June (late afternoon) and four on the 23rd. July 1st still saw four eggs, but on the 5th there were four hatched young in the nest. Late in the afternoon of the following day I watched the male eating bread and milk, he then flew to the nestbox and went in for about five seconds. There was much cheeping as he entered. When he left he flew straight to the female and the other young hidden in the shrubs. I noticed that the female always left the nest at the same time if I went to the aviary.

On the 10th the four nestlings were well feathered and, once again, unequal in colour; one was smaller than the others. Three days later I ringed them with Budgerigar split plastic rings—Red, Dark Green, Black & Black and Red & White. Next day I moved the 1st round to another aviary, and on the 18th the second brood left the nest.

On 21st July the smallest bird, Black & Red, was found to have inturned tail and pronounced fault bars across the tail (bars indicating a dietary deficiency at intervals during the growth of the feathers). On 5th August this bird was found drowned in the water dish. Red & White also had fault bars on the tail and one slightly twisted foot, the other two appeared to be perfect.

On 17th August Black and White (1st round birds) were moulting black bibs, and obviously were males. Blue and Green eventually proved to be females.

At the end of the month I could not find Dark Green (2nd round) or her mother, and realized that they must have escaped when the feeding perch was left open accidentally a few days earlier. Green (1st round) proved to be fittest female so I put her with her father on 14th September, having removed Red, Red & White and the 1967 bred daughter two weeks earlier. Having been without a female for two weeks the male was most excited at the introduction of Green. He chased her all round the aviary. Whenever he managed to perch near her he adopted a posture with drooping wings, open beak and a slightly fanned tail which he flicked up irregularly about twice a second. Several times the female flew to one of the wire netting aviary sides. This prompted the male to jump around her landing on the wire netting, as if forming a circle about three feet in diameter with the hen at the centre. At times she retreated in a dense shrub, whereupon the male kept jumping to and fro along a nearby sloping perch. Unfortunately I did not observe, or did not record, the end of this activity.

I have no more relevant notes concerning these birds until April 1969 when I released all the remaining young except for the female, Blue, who was placed in a separate aviary as a reserve. On 28th April I discovered Green had one egg in the Upton permanent box.

The food given was similar to that of the previous year as far as soft wild foods and maggots was concerned. However, I decided to experiment with the soft food to see if I could overcome the problem of soft chicks having deformed feet. Instead of separate dishes of soaked puppy biscuit, egg biscuit food, and bread and milk sprinkled with calcium phosphate I made up the following mixture:— 1 part breadcrumb, 2 parts puppy biscuit (Saval number 1), 2 parts chick crumbs, and 1 part Farex. To 1 lb of this mixture I added one teaspoon of calcium phosphate and half a teaspoon of Lusty's Pure Kelp Powder (rich in minerals made from seaweed). This was moistened with water when supplied fresh daily.

On 10th May there were three eggs in the Upton permanent box, but the female seemed to have deserted them. The male no longer showed any interest in her, but he was often excited by wild females outside the aviary. I decided to add his other daughter, Blue, to this aviary, and also put in a new tit nest box. Next day the male was seen entering the new box, and a nest was being built in it on 18th May. By 25th May there were only two eggs in the old box, both cold. I removed these and put them under a broody Canary. These eggs had a pale greyish green colour, one was spotted and mottled all over with greys and browns, the other only had a little of this pattern at the thick end (the Handley states that one egg in a set is usually much lighter than the rest). My fostering experiment was a flop as both eggs were clear.

On 26th May there was one egg in the new box; subsequently two more were added, but I did not discover which female had laid them. On 14th June these eggs were deserted, but Green had four eggs in the old box. One week later Green had one tiny chick and three eggs, with nest material was being placed over the eggs in the new box. Green's remaining three eggs failed to hatch, and the chick was eventually found dead on the ground. It was well feathered and normal in colour (it was the first offspring from the pairing dilute male \times daughter).

In 1970 I continued experimenting with the diet. I reverted to bread and milk sprinkled with calcium phosphate as the main soft food. This time however no maggots were given. Green had vanished by 1st June and I presumed that she had died or escaped. On 3rd June Blue had five eggs in the Upton permanent box. One had hatched by the 10th when I started giving about 40 mealworms daily. No other eggs hatched and the chick subsequently died as it was becoming feathered. This chick too was normal in colour.

In 1971 I added two pairs of Zebra Finches to the aviary. One pair nested in the Upton permanent box and I eventually found Blue wedged in the hole of this box. She appeared to be both going in and turning to get out. I suppose she was driven away by the Zebra Finch. As the Sparrow's corpse was like a cork in a bottle the poor Zebra Finch could not get out to feed, and she too was dead when I found them.

that year the old male Sparrow also vanished, bringing this experiment to a close.

I think the main point about the rearing of healthy undeformed young was that this only occurred when there was a plentiful supply of both maggots and bread and milk sprinkled with calcium phosphate. I do not know for certain that these are essential but I would use them again if trying to breed this species, except that I would probably use a multi-mineral/vitamin powder such as Vionate in preference to calcium phosphate.

Finally a few words on the failure to breed coloured or dilute birds may be of value. One fact which emerges is that this is not a sex-linked recessive type (as found in cinnamon Canaries for example). If it were sex-linked the dilute male paired to a normal female would have produced split dilute males and dilute females; however, all the females were normal in colour. If a non sex-linked recessive factor was involved all the young would have been split dilute, i.e. normal in colour, and young from the father \times daughter mating should include both dilutes and split birds of normal colour. The two young actually produced from this mating were both normal in colour, but such a small sample does not rule out the possibility of a non sex-linked recessive factor.

* * *

A COLLECTION OF RARE BIRDS NEAR PARIS

By J. DELACOUR (Clères, France)

Some twenty miles north of Paris, at 'le Clos du Cédres', Mesnil Aubry, Dr. Henry Quinque has gathered an unusual collection of rare birds, particularly Parrots and Parrakeets.

Born at Limoges, he was initiated to aviculture by our late member J. A. Decoux who for many years maintained in the vicinity, at Géry, an outstanding collection of Parrakeets, Doves and small birds, often writing about them for this magazine. Dr. Quinque still keeps there the more usual species of Broadtails and other Parrakeets, in his mother's garden.

It is at Mesnil-Aubry, however, that he has installed his rarer birds. The accommodation consists essentially of a vast block of 30 aviaries designed for Parrots. Each flight is 40 ft. long, 4 ft. wide and 6 ft. high and it has a heated shelter. They are elaborately built of steel and concrete, with all sorts of modern devices for the welfare of the occupants. A long indoor corridor and an open air one serve the aviaries at both ends. Other aviaries are found in different parts of the grounds, inhabited by other Parrakeets and also by some rare passerine birds, particularly Rothschild's Mynahs, Red Birds of Paradise and a few others.

The small park surrounding the house is walled-in and has a large pond: Cranes, Flamingos and Waterfowl live there at semi-liberty, as well as a few mammals. A pair of Kagus inhabit an enclosure.

The following species of Parrots and Parrakeets are represented at present at Mesuil-Aubry:

Great Palm Cockatoo: A pair, plus a tame male, over 40 years old, which used to be U. Decoux's pet. *Gang-gang Cockatoo*: Three pairs in perfect condition, which have not yet started breeding. *Queen of Boavaria's Conure*: Several tame young specimens, recently arrived. *Amboina King Parrot*: Also several lately arrived. *Australian King Parrot*: Regularly breeding pairs. *New Guinean* and *Australian Crimson Wings*, also regular breeders. *Horned Parrakeet*: A male of this very rare New Caledonian species. *Uvea Parrakeet*: Two males of this rare species, one of which has produced hybrids with a female *Red-fronted Kakariki*, several pairs of which live and breed there. *Rock Peplars*: Regularly breeding. *Twenty-eight, Port Lincoln, Cloncurry* and *Brown's Parrakeets*. The latter reared a number of young, but Dr. Quinque has some difficulty in keeping them alive after the first six months. A fine pair of *Pesquet's Parrot* has recently been added to the collection.

Of the smaller species one finds a number of pairs of *Manycoloured Hooded* and *Naretha Blue-bonnets* which are breeding very successfully.,

Swainson's and *Scaly Lorikeets* are also present, as well as some wild-caught Cockatiels.

We hope that Dr. Quinque will soon report personally on his breeding successes with his rarer birds.

* * *

BREEDING THE BLACK-HEADED SIBIA

(*Heterophasia capistrata*)

By RAYMOND FRANKLIN (Chesham, Bucks., England)

I obtained a pair of Black-headed Sibias, *Heterophasia capistrata*, from a Buckinghamshire dealer in February 1971. At first glance these birds are difficult to sex, but on closer scrutiny of this pair the hen has one or two pale grey primary feathers in the wings, and while the cock is bold the hen is much less tame. Both birds are mainly chestnut-brown, with black crests, and a long tail the feathers of which have grey and black terminal bars.

Their flight is short and jerky and they seem to jump from perch to perch like their relatives the mesias, *Leiothrix* species. They call continually with small babbling notes. The only time I heard what might be called a slight song was when they paired up before nesting. On a few occasions, associated with what appeared to be a nesting display, I heard a peculiar noise rather like a cat mewing two or three times in succession.

This was followed by the cock chasing the hen at a terrific speed round the aviary and in and out of a bamboo clump, and attempting to peck the cloaca of the female. Presumably this preceeds copulation. Cloaca-pecking in babbler courtship has been recorded for other species (Harrison 1967).

With regard to diet, all that I can persuade them to feed on are grapes, cut up small, and a continual supply of "nectar" which consists of honey, marmalade, and Farlene Baby Food mixed with water. I have tried the usual proprietary soft foods but they refuse to touch any. Apart from insects which they "hawk" on the wing this is their basic diet. 1971 was a good year for wasps and they really relish these, it is fascinating to see them hold a wasp down with one foot and remove the sting. Sometimes they don't bother and just swallow the wasp whole.

After wintering them in the bird room (which is kept reasonably warm by electric heating in bad weather) they were put out into a flight in the second week of March 1971. The flight was 4m. x 2m x 2m x and planted with a clump of bamboo and some ferns.

They showed no interest in breeding in 1971. As with my Silver-eared Mesias, I overwintered them in the bird room with a pair of Spreo parrots. On 12th March 1972, when the weather was rather cold, but fairly fine, I put them out in the planted flight again, but this year I fixed a trellis in the flight and trained some wild hops to climb it.

In May I obtained some fibre from a Palm tree, the same material that the Silver-eared Mesia had used (Franklin 1972).

On 30th May the cock was seen to carry some of the fibres about the flight. On 10th June I saw him display to the hen with a long strand held in his bill, raising his crest and vibrating his wings. This went on from time to time until 16th July when I saw both birds commence to build up in the clump of wild hops. By 24th July the nest appeared to be finished. It consisted of an outer layer of fibres, partly bound around the hops; then a thick layer of fibres interspersed with a number of bamboo leaves and other dead leaves, and within this a deep cup lined with fibre. It was about the size of a Blackbird's nest, *Turdus merula*, but with a shallower and deeper cup.

On 25th July I saw the cock chasing the hen at terrific speed, calling loudly and making the peculiar mewling noises. Copulation was not observed. On 28th July, when I saw the hen leave the nest, I examined it with the aid of a mirror and could see one egg, rather like that of a Greenfinch in size and colour.

Both birds shared the incubation, which lasted 14 days, with one young hatching on 12th August. The following day another young one hatched out, and because the hen is not so tame I kept out of the flight for fear of upsetting her. From then on it was a case of supplying as much live food as possible. This meant going out into the fields every day with a large net to catch flies. Luckily the weather during this period

was rather hot, and this made it easier for me since the parents were able to catch plenty of live food in the flight.

I would have preferred to let the birds come out at liberty to collect food but as I have a Siamese cat I thought the idea might be a little imprudent. On 28th August the two babies came out of the nest, the feather colouring being the same as that of the adult birds. They roosted apart from each other and unfortunately the weather became a little chilly. They both died at two days out of the nest.

The parents appeared to be mating again at about 30th August, but nothing came of this, and I brought them back into the bird room on 15th October. This year (1973) they have gone into a large planted flight and I am hoping for better results.

REFERENCES

- FRANKLIN, R. 1972. Breeding the Silver-eared Mesia. *Avicult. Mag.*, 78 : 83-84.
 HARRISON, C. J. O. 1967. Some notes on babbler behaviour. *Avicult. Mag.* 73 : 28-33.

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FURTHER OBSERVATIONS ON THE TOURMALINE SUNANGEL HUMMINGBIRD

By A. J. MOBBS (Walsall, Staffordshire, England)

Since writing the notes on the Tourmaline Sunangel, *Heliangelus exortis*, which appeared in Vol. 79 : 79-83 of this magazine. I have learnt from personal observation, that the species will in fact roost on one foot.

For two weeks I purposely entered my birdroom before the birds had awakened from their night's sleep, and each time I found the Sunangel using the left foot only to grip the perch. It is surprising the bird uses the left foot during the night period, because as already mentioned in my previous notes, the right foot is favoured during the hours of daylight.

Since writing my previous notes, I have also had the opportunity to examine male *H. exortis* both in juvenile and post-juvenile plumages. The juvenile plumage resembles that of an adult female except for the white patch on the chin and lower throat which in the juvenile male is smaller and speckled with green. Male's in post-juvenile plumage resemble the adults but are shining rather than glittering green on the chest. As with the adult male, the chin and upper throat is violet-blue and the lower throat is red. However, although these feathers are somewhat iridescent, they are not so brilliant as in the adult bird, nor are they as pronounced. In the post-juvenile plumage, there is a faint white line running along the bottom edge of the red of the lower throat. The tail feathers in the post-juvenile male, although longer than that of the juvenile bird (and the female), are not so long, nor as deeply forked as in the adult bird.

COLOURFUL PLUMAGE IN TROPICAL BIRDS

By RONALD I. ORENSTEIN (Division of Birds, Museum of Zoology,
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Sydney, Australia)

In a recent paper in AVICULTURAL MAGAZINE, Willson and von Neumann (1972) draw attention to the higher proportion of colourful birds in the tropics than in the temperate zone, but are unable to suggest any general hypothesis to explain this phenomenon. A reexamination of their data, however, shows that the problem can be at least clarified by separating the colourful birds in the tropics into two groups: those which have developed colourful plumage for the same reasons as temperate species (and presumably have the same proportion of colourful forms), and those which have developed bright colours in response to purely tropical conditions. Birds in the latter category would be expected to belong to groups absent in the temperate zone, and the addition of such groups to the fauna would then account for the increase in the proportion of brightly-plumaged birds in the tropics.

That such a division does occur (as opposed for any general tendency for birds to be more colourful in the tropics) is indicated by a consideration of groups with wide latitudinal ranges. The following table, drawn from the appendix to Willson and von Neumann's paper, compares the proportions of colourful birds in families having representation of 10 spp. or more each in temperate North America and in South America.

	North America	South America Tropics	South America Nontropics
Accipitridae	0/23 (0%)	0/36 (0%)	0/11 (0%)
Columbidae	0/11 (0%)	0/26 (0%)	0/15 (0%)
Trochilidae	15/15 (100%)	84/133 (63%)	72/96 (75%)
Picidae	8/22 (36%)	8/72 (11%)	<10 spp.
Tyrannidae	3/31 (9%)	15/202 (7%)	0/106 (0%)
Corvidae	6/15 (40%)	7/11 (64%)	<10 spp.
Troglodytidae	0/10 (0%)	0/28 (0%)	0/11 (0%)
Turdidae	6/13 (46%)	0/20 (0%)	0/12 (0%)
Vireonidae	1/12 (9%)	2/19 (11%)	<10 spp.
Parulidae	25/53 (47%)	21/27 (78%)	10/21 (48%)
Icteridae	11/20 (55%)	30/48 (63%)	8/15 (53%)
Fringillidae	16/77 (21%)	20/112 (18%)	19/73 (26%)
TOTAL	91/302 (30%)	187/734 (25%)	109/360 (30%)

It is apparent from the above that in most families there is no tendency for the proportion of brightly coloured birds to increase in the tropics. The exceptions are the Corvidae, Parulidae and Icteridae. The higher proportion of colourful corvids in the New World tropics is almost certainly a reflection of the absence of the genus *Corvus* in South America. Parulids also show a decrease in diversity in the tropics. The largest genus of the family in tropical South America is *Basileuterus* (11 of the

19 species) whose members, although many have yellow underparts or well-marked crown patches (6 spp. at tropical elevations) and are therefore colourful by Willson and von Neumann's standards, strike the observer as much less brilliant than most North American species (data from Meyer de Schauensee 1970, which excludes Central American species).

The highest proportions of colourful species in the New World tropics, as listed by Willson and von Neumann, are found in the Psittacidae (100%), Trogonidae (100%), Momotidae (100%), Galbulidae (100%), Capitonidae (100%), Ramphastidae (100%), Parulidae (78%—but see above), Coerebidae (74%), Bucconidae (67%), Corvidae (64%), Thraupidae (64%), Trochilidae (63%), Icteridae (63%), Pipridae (51%), and Cotingidae (28%) (ignoring the Cathartidae). Most of these families have poor representation or are absent in temperate North America. More important, they represent ecological types largely confined to the tropics. Most are obligate or almost obligate frugivores (e.g. Psittacidae, Trogonidae, Capitonidae, Ramphastidae, Pipridae, some Cotingidae, Thraupidae, some Icteridae (e.g. *Icterus*)) or nectarivores (e.g. Trochilidae, Coerebidae) (Haverschmidt 1968, Thomson 1964). These feeding types are rare in temperate latitudes, presumably because the stronger seasonality restricts the availability of fruit and nectar during much of the year. A similar correlation between diet and plumage holds in the Old World, where many of the brilliantly coloured species are frugivorous (e.g. Psittacidae, Musophagidae, Trogonidae, Capitonidae, Paradisaeidae) or nectarivorous (e.g. Psittacidae (Lories), Dicaeidae, Nectariniidae) (Thomson 1964, Gilliard 1969). Contrasted with this is the failure of the large families of insectivorous birds in the tropics (e.g. the Dendrocolaptidae, Furnariidae, Formicariidae and Tyrannidae in the New World, and the Sylviinae and Timaliine complexes in the Old) to produce more than a few colourful species. As a further indication that frugivory and bright or striking plumage tend to be correlated, in the Cotingidae and the closely related Pipridae those genera with bright colours or ornamental plumage (e.g. *Phoenicercus*, *Cotinga*, *Xipholena*, *Iodopleura*, *Haematoderus*, *Querula*, *Perissocephalus*, *Gymnodoera*, *Procnias*, *Rupicola*, *Pipra*, *Xenopipo*, *Chiroxiphia*, *Manacus*) are obligate or primarily frugivores, while those with more dully-coloured plumage (e.g. *Attila*, *Laniocera*, *Rhytipterna*, *Lipaugus*, *Pachyramphus*, *Platypsaris*, *Tyranneutes*, *Schiffornis*, *Neopelma*) are largely insectivorous (Slud 1964, Haverschmidt 1968). Similar cases exist in the Old World, where the fruit-eating pigeons of the genus *Ptilinopus* are the most colourful in the family, and in the Drepaniidae of the Hawaiian Islands, in which the largely nectarivorous genera *Drepanis*, *Ciridops*, *Palmeria*, *Vestiaria* and *Himatione* are generally more colourful than the insectivorous or granivorous genera *Loxops*, *Psittirostra*, *Pseudonestor* and *Hemignathus* (the exceptions being the black *Drepanis funerea* and the red *Loxops maculata flammea* and *L. c. coccinea* respectively). (Amadon 1950).

There are several possible reasons why frugivorous and nectarivorous birds are likely to be brightly coloured. Firstly, food items for such birds are more likely to be concentrated in circumscribed areas—i.e. single fruiting or flowering trees—than is the case for insectivorous or granivorous species. This tends to bring the birds into close physical proximity during feeding, and may as a result increase aggressive encounters. Hummingbirds, for instance, are highly aggressive, as are the nectarivorous Drepaniids in Hawaii. The Iiwi (*Vestiaria coccinea*), the most brilliantly coloured of the latter family, is also one of the most pugnacious (personal observation). Frugivores are apparently less overtly aggressive than nectarivores. The presence of bright colours in both groups, however, may provide more striking aggressive signalling patterns and as a result contribute to the spacing of individuals at feeding sites. Secondly, the utilisation of a food source, such as fruit or nectar, that can be gathered with a minimum amount of search may free the male from the necessity of assisting the female in parental care, and as a result promote the development of polygamous mating systems in which the male mates with a wide variety of females instead of forming a pair-bond. In such birds the male normally develops brilliant colours and/or ornamental plumage for use in display. The first factor mentioned above may be more important in those forms in which both sexes are brightly coloured (e.g. *Ptilinopus* doves, Psittacidae, Capitonidae, Drepaniidae, many Thraupidae); the second applies to such groups as Paradisaeidae, Pipridae and *Rupicola*. The two factors are not necessarily mutually exclusive; many hummingbirds have polygamous mating systems and are highly aggressive at feeding sites.

In addition it should be pointed out that many of the birds considered are birds of edge and forest canopy (presumably as a result of the distribution of their food sources), and that bright colouration may render birds most inconspicuous against the brilliant greens of tropical rainforest foliage. Again, this is not a contradiction of the above-stated explanations; a bird which might be inconspicuous to an aerial predator, viewing it from above, may be quite the opposite to a conspecific at its own level in the canopy. As an example, in many of the *Ptilinopus* doves the back is bright green while the head and underside carry distinctive markings in other colours. Thus these birds would present a completely different aspect when viewed from below or on the same level—as a conspecific might see them—than they would viewed from above against a green background.

The evidence, as reviewed above, is thus against any general tendency for birds to be more colourful in the tropics than in temperate latitudes. It seems probable that the primary reason for the larger number of colourful birds in the tropics is the addition to the avifauna of nectar- and fruit-eating groups not found in the temperate zone. Admittedly other special factors may be present in the tropics; for instance, the

Momotidae, Galbulidae and Bucconidae are not frugivorous but do represent feeding types absent in higher latitudes. Probably there are a wide variety of reasons for the evolution of bright plumage, but for many groups the explanations will be equally applicable in the temperate zone.

Dr. H. F. Recher gave useful advice and comments during the preparation of this note; Drs. F. Talbot and J. Kikkawa criticised the draft manuscript.

REFERENCES

- AMADON, D. 1950. The Hawaiian honeycreepers (*Aves, Drepaniidae*). *Bull. Amer. Mus. Nat. Hist.* **95**: 151-262.
- GILLIARD, E. T. 1969. *Birds of Paradise and Bower Birds*. London, Weidenfeld & Nicholson.
- HAVERSCHMIDT, F. 1968. *Birds of Surinam*. Wynnewood, Pa.: Livingstone Press.
- MEYER DE SCHAUNSEE, R. 1970. *A Guide to the Birds of South America*. Wynnewood, Pa.: Livingstone Press.
- SLUD, P. 1964. The Birds of Costa Rica. *Bull. Amer. Mus. Nat. Hist.* **128**: 1-430.
- THOMSON, A. L. ed. 1964. *A New Dictionary of Birds*. London: Nelson and New York: McGraw-Hill.
- WILLSON, M. F. and R. VON NEUMANN. 1972. Why are neotropical birds more colourful than North American birds? *Avicult. Mag.*, **78**: 141-145.

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NESTING OF THE KEA, *NESTOR NOTABILIS*, AT JERSEY ZOO

By MARGARET MALLET (Bird Section, Jersey Wildlife Preservation Trust)

The Kea, *Nestor notabilis* is found in the South Island mountain areas of New Zealand, with a more extensive range than in the latter half of the last century, in spite of the massive toll taken by sheep farmers. They nest on the edge of the high level forests and obtain food from the forests clothing the mountain valleys, ranging widely to the alpine grasslands for Autumn fruits. During wintertime their natural curiosity and lack of food brings them further down the mountains to human habitation levels, where they tend to annoy the local population by their destructive habits, which include pulling tiles off roofs, chewing window frames and even entering houses and helping themselves to objects which take their fancy.

This provides entertainment for the tourists, but they too can suffer the disadvantages of these birds' curiosity and boldness, since they are not averse to hopping into cars and creating the same sort of havoc that they do in houses.

In May 1963, a pair of keas was presented to the Jersey Zoo by the New Zealand government and a second female arrived the following August. All three were housed in an aviary, the dimensions of which are approximately 30 ft. × 12 ft. × 9 ft. high with a shelter provided at the

ear, under which are two large barrels, about four feet from the ground; the birds use these to sleep on but very seldom go inside them. In the centre of the aviary is a large mound of granite rocks and logs and edged amongst these is a metal container for bathing and drinking.ample perching is provided and fresh branches are given daily—Willow being the most acceptable. The area under the shelter is sanded and the remainder of the aviary is grass.

Their diet consists of sunflower seeds, peanuts, omniverous nuts, hard-boiled egg (of which only the yolk is eaten) and any fruits and vegetables in season. Added to this are the staple, oranges, apples, bananas, plus dates, fresh coconut, figs, melon, chicory and lettuce. They also eat kidney, but are more enthusiastic about it during the breeding season, and brown bread soaked in a nectar mixture is always the first item to be eaten. Their lettuce is usually taken straight to their water container and "dunked" several times before it is consumed, but I have not seen them give the same treatment to any other item of food except for their carrot. The young keas on the other hand, spent a great deal of time around their water bowl and a large amount of their food was to be found at the bottom of it each morning.

In December 1965, a wooden "T" shaped nest-box was installed, but although it was thoroughly inspected at the time, no great interest was shown in it until the beginning of January 1966, when the male and female began spending a large part of their time in it. The second female was always driven away if she attempted to enter, and if she succeeded, was promptly chased out again after a brief bout of squabbling, but once clear of the tunnel entrance, was left to her own devices and at no time was she harassed by them. Eventually, she was seen to spend most of her time at the front of the aviary although they all fed from the same dish. However, by the end of February, it was obvious that no serious attempt at nesting was to be made that year, and by the end of the month all three were available again.

In the years 1967, 1968, 1969, 1970, 1971 and 1972, four, five, four, seven, seven and seven eggs were laid respectively, the majority of which were fertile. Several of these disappeared during the latter part of incubation and we had strong reason to suspect that the male was responsible for this, since whenever he went to feed the female, a good deal of squabbling was heard before she chased him out of the box, although he was never actually seen to take an egg. In order to cut down the losses as much as possible, each egg was removed as it was laid and replaced with one from a dummy and put back a few days before they were due to hatch. Some chicks were hatched during these years, but none survived for more than a few hours, and an unsuccessful attempt was made to hand-rear one in 1970. The second female did not appear to be a disturbing influence on the male during the breeding season, but nevertheless, it was decided to remove her to a small cage some distance away, and to make another one for the

male kea which was built at the back of their aviary. So at the beginning of the 1972 season, the odd female was taken out, and when the clutch of seven eggs was completed, the male was shut into his quarters where he could still have contact with the female and eventually the young. Unfortunately, during the time the pair were together, to ensure fertilisation one egg disappeared and one was found damaged at the entrance of the nesting area, leaving a clutch of five.

An interesting point is that a kea clutch in all accounts, only consists of four eggs, maximum, yet on three occasions our female has laid seven eggs and once five. On several occasions she has laid one or two eggs and then stopped for a period of about a week before starting again and laying every two or three days. This has inevitably meant a long gap between the laying of the first and last eggs, another reason for taking them away and putting them back once she has started to sit. Therefore, the first eggs were sometimes placed under pigeons and it was a chick from one of these fostered eggs that we attempted to hand-rear.

In 1972, incubation commenced on the 16th February and on the 11th March, the first chick had hatched, Nos. two, three and four hatching on the 12th and 14th. The fifth chick was unfortunately dead in shell. On hatching, the chicks are covered in white down, with large sack-like structures at outer edges of their beaks, giving them a rather grotesque appearance.

Beaks, legs and areas of skin around the eyes are pale pink for the first few days, gradually changing to a greyish green, and eventually turning to a clear yellow at the age of about eight weeks, except for the beaks and legs which turned black. This colour is retained for at least two years, and probably until they approach maturity at four to five years.

The chicks were checked daily and at all times had full crops and stomachs, the first food to be seen in their crops being carrot. Our Keas and also those at Zurich, are very partial to chicory and during the rearing of their chicks were given three a day. It is customary for the male kea to feed the female while she has young, but since our male could not do this by going to the nest box, he used to feed her through the wire of his cage, whereupon, she would go straight back and feed the chicks. Three feeds a day were given at this period, one of which was placed in the tunnel to the nesting area.

On 17th March one dead chick was found in the tunnel and we had a few anxious days wondering if they were suffering from some contagious disease, but the remaining young continued to grow rapidly and on the 5th April, the first pin feathers could be seen along the edges of their wings. By the second week in May they were fully feathered and although they would venture along the tunnel, they were not seen in the aviary until the 26th May, but since they seemed very timid it is probable they had been out at night-time before that date; once they realised they were being observed, they would dash back to the safety of their nest-box.



Copyright]

Kea one day old

[Phillip F. Coffey



pyright]

Kea 24 days old

[Phillip F. Coffey



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Keas 24 days old

[Phillip F. Coffey



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Kea 32 days old

[Phillip F. Coffey

As they became more confident and spent longer periods outside, it was easier to note their behaviour and they and their father appeared to take great interest in each other, but he was not seen to feed them until several weeks later.

The male kea was released from his cage on 15th June and rapidly settled into family life, although for the first three days he was put into his quarters at night. No antagonism was observed from him towards the young ones, but neither did he appear to take any great interest in them; it is possible that the female could have been partly responsible for this since she was the dominant party at this period and would not tolerate him anywhere near her, and it was with her that the young spent a great amount of their time.

The timidity they displayed at their debut, rapidly diminished, and by the beginning of July, one in particular had become most confident and friendly; this specimen was heavier in build than the other two, with a longer curved beak and his sex was tentatively determined as a male. He readily took food and play objects from my hand, and took great delight in popping my rubber gloves in the water container until, at the risk of offending him I decided to terminate this practice, but he still derived great pleasure from trying to pull them off my hands. He also enjoyed playing with my clothes, tugging at a leather belt, boots and most of all emptying the rubbish bucket by tossing everything out with his beak. The other two would watch these activities with great interest, occasionally attempting to wrest a plaything from him, but since he was the dominant one, they usually had to wait until he lost interest in it, and even the objects they took from my hand, he quickly commandeered. Robert Keller observed the behaviour of this group of Keas during the latter part of June, and it is due to him, I am sure, that the young keas and I derived so much pleasure from each other's company, since he advised that spending as much time with them as possible could be nothing but advantageous to all of us.

On the 25th October one pair of the young keas was sent to Paignton Zoo, and later the single female to Chief Officer of the Parks Department, London.

In the current year (1973) they are again nesting successfully, with three young hatched. This time the male has been permitted to remain with the chicks since hatching and his behaviour has been exemplary. We believe this is due to a second nest-box having been installed and his having somewhere to go during incubation apart from the nesting area.

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NOTES FROM SLIMBRIDGE

S. T. JOHNSTONE (Stroud, Glos., England)

At Slimbridge, the Wildfowl Trust has its major collection of waterfowl, screamers and flamingos. This concourse of birds is the largest and most comprehensive collection of one group of animals in the world and it has been my privilege, over the last twenty-six years to collect them together and to create their environment.

I came to Slimbridge with a medical training and a knowledge of architecture and building construction. My acquaintance with waterfowl was to say the least, limited. But I was fortunate in having as my boss Sir Peter Scott, whose enthusiastic support and encouragement has made the project so worth-while. Furthermore I was lucky in the early days to be under the tutelage of that great and unassuming aviculturist, John Yealland.

Apart from the passerines in the Tropical House, there have been over this period 197 forms represented of which 163 produced eggs and 15 kinds have been reared. It is difficult to be sure of first records, but it is believed that 14 of these were reared for the first time in captivity and 27 in Britain. One of the attractions of New Grounds is the wintering flocks of wild swans, geese and ducks and ample facilities are given to our members for viewing these birds at close quarters, and without too much difficulty. There are six towers of varying heights, some fitted with powerful binoculars, numerous hides, and a very comfortable observation room, adjoining the hostel, where one can view the winter population of Bewick's Swans, together with numerous Pintail, Wigeon and Shoveler.

For many years the collection was kept in an area of some thirty-five acres and this posed particular problems regarding the segregation of the more aggressive species and finding fresh grazing annually for rearing the young birds. However, in 1972, we were able to expand and the new development has made it possible to fox-proof 100 acres. It was intended that the extension should include a Nene park, swan pen, Mallard aviaries, and further heated quarters. There would also be additional grazing for flocks of fifty or more geese of individual species. An eleven acre field has also been fenced close to the propagation centre for rearing purposes. An additional water supply was planned to be supplied by means of Well Points.

For the collection the amenities are many. There are four series of aviaries and perhaps the most interesting are those adjoining the propagation building, which are built on the principle of the tent pole. Steel hawsers, tensioned by means of bottle screws, rise upwards and forwards from the seven-foot-high shelter to a point fifteen feet above the observation path and held in position by steel scaffolding poles. The structure is covered with half-inch wire netting and provides a flight space

some twenty feet long. Each partition has a pond with flowing water and a winter-house with infra-red heat and a tapped water supply.

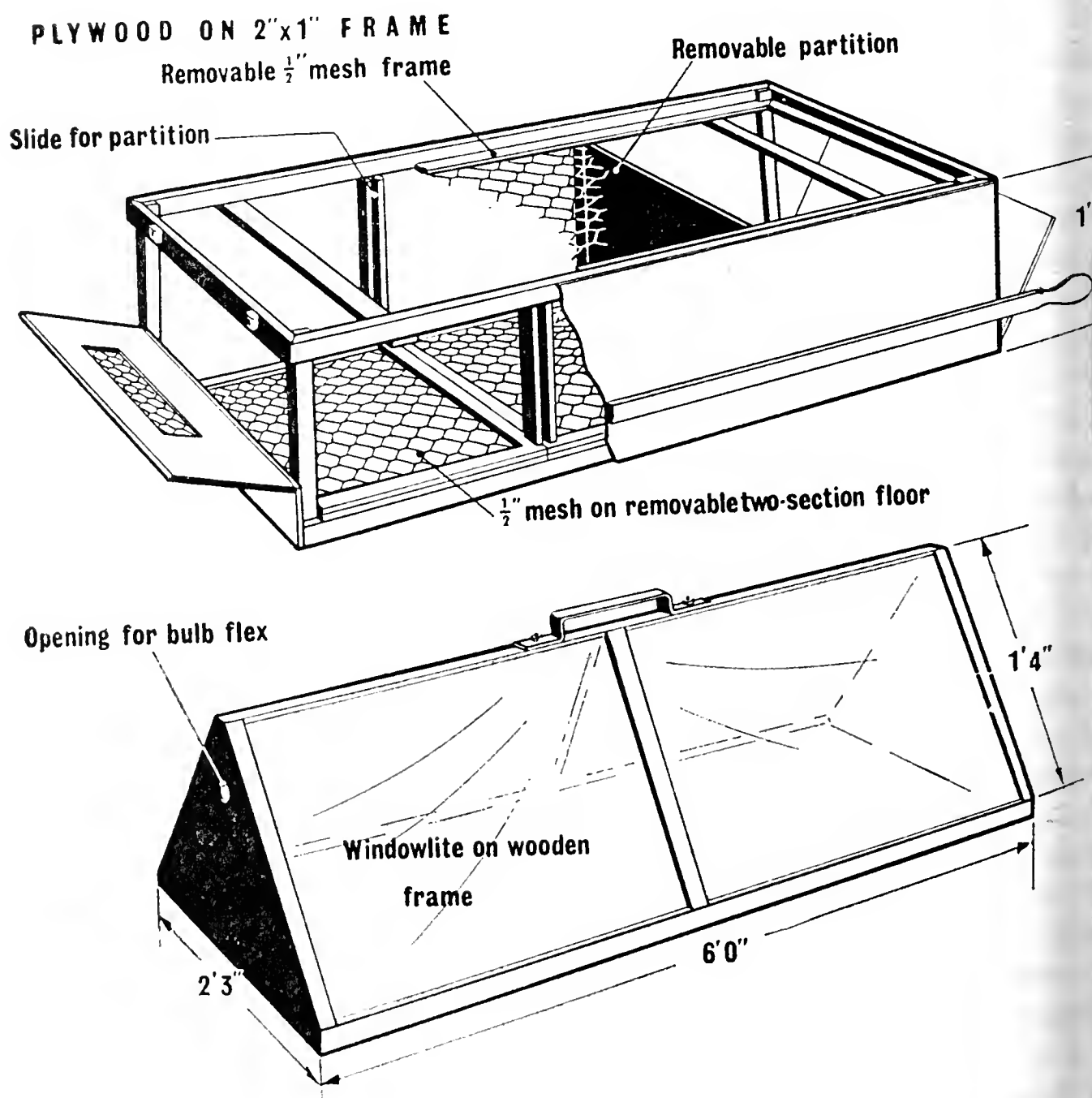
The Guinness Aviary is eighty yards long and is constructed of semi-circular frames of tubular steel with a radius of twelve feet. Each section has an external pond with flowing water and a heated house with separate water supply. This structure was presented to the Trust some fifteen years ago by the famous Dublin Brewery. Since that time among the rarer birds to breed therein were Spotted Whistling Duck, New Zealand Brown Duck, Hartlaub's Duck and White-winged Wood Duck.

The other two rows of aviaries are of the conventional type with flat roofs and wooden frames. Both have external and internal water-ways with flowing water and infra-red heat. They are used principally for rearing full-winged birds and for wintering the more delicate birds in the collection.

The Propagation Centre has recently been rebuilt through the generosity of an anonymous benefactor. The building contains food silos, rooms for milling food, food preparation, insect propagation, incubation, surgery and X-ray. There is on the first floor a large work shop and store room together with a staff recreation room. Half the ground floor is devoted to an indoor rearing unit. Here there are some forty raised pens, each virtually one yard square with plastic and wire-netting floors and roofs. The partitions are removable and are wooden. The pens can therefore be altered in size to suit the number and size of the young birds. Each is supplied with an infra-red lamp adjustable for height, and a plastic mat the latter being from the hygienic point of view far more easy to clean than sacking. The floor of the unit is in rendered cement and is washed down daily. Originally intended for the more delicate species without foster mothers, it has been found that the installation is extremely useful for all species, particularly when weather conditions are bad.

In the early days, in fact for the first seven or eight years, there was no electricity at New Grounds and the natural flow of water was very, very low. At this time the young were reared on an 'S' bend of water leading into the top pond of the Rushy Pen. However, with the arrival of power, I constructed a prototype duckery with a water course where the water flowed over a step from pen to pen. There were three rows of pens, but the last pen in each row had water from all the others in the row. This was hardly the basis of good hygiene. In consequence a further duckery was built. Here water, pumped up from water bearing sand 10 ft. below the surface, is fed into a raised header channel to three rows of pens. From the header channels water is fed into a shallow, wide, cement-lined ditch to each of the pens. In one row the ditch is widened out to deeper ponds for the diving ducklings. The water leaves the pens by means of waste drain, whence it flows into a disused rhine. The pens are some 150 sq. ft. in area and at the height of the breeding season can be sub-divided to accommodate the thousand young birds that are reared

annually. The water supply to each pen is controlled by a wooden tank and the 3500 gallons per hour supply is found to be adequate for this purpose. There is a power supply available to each pen. Weather conditions permitting and provided the downies are feeding satisfactorily, they are moved from the internal to the external duckery about the fifth day where they are installed in one of the rather sophisticated brooders that I first built some fifteen years ago and which have been gradually modified as experience with their use has proved necessary. The alterations have been principally in the reduction of length from six to four ft. and in making the handles detachable for the purposes of easier handling and storage. Swans, geese and ducks, with or without a bantam are reared with equal facility in this type of brooder.



Other facilities for the captive birds include a recently constructed sea-duck pool. This consists of three ponds at different levels and connected by rocky cascades. The highest is at eye-level, the middle at waist, and the lowest at ground-level. The middle pond is retained by a Cotswold stone wall and here visitors can approach close to the birds, which are fed on stone shelves projecting from the interior of the wall at water-level. The water supply is pumped into the top pond by means of a well-point system. It was hoped that the cold fresh water pumped up from below ground would also be clear, but unfortunately due to the high iron content it is translucent rather than transparent and in consequence the proposed underwater window has not been installed.

The Tropical House was another project sponsored by a generous benefactor. It has a floor space of 2700 sq. ft. and a maximum height of 5 ft. At least two thirds of the floor space is water. There are three ponds connected by waterfalls, one relatively large with the surface five ft. above the ground. It is fed by a waterfall from almost roof height. Water circulates from here through the two ft. high centre pond into one at ground-level. Thence it is pumped back again over the top waterfall. Originally filled from the mains the water is circulated twenty-four hours a day. The walls, a cavity structure with an internal skin of Thermacel blocks and a double roof of transparent plastic were erected through the kindness of two members of the Trust. The Royal Botanical Gardens, Kew, supplied the plants and advised on planting. All the internal construction, rock-work, ponds etc. were carried out by the staff. The building is kept in winter at a temperature between 65 and 70°F by means of Wansons Thermopiles, hot air heaters, in duplicate (in case of failure). A Lister generator cuts in automatically in case of power failure. There is a sprinkler system to simulate tropical rain and a lighting system to increase the hours of light during winter months.

The '*raison d'être*' for the tropical House was the hope of breeding the Pigmy geese. Unfortunately, up to the time of my retirement, the only waterfowl to breed there were the Hottentot Teal. But having produced suitable conditions, it was decided to try our hand with some passerines. And Hummingbirds, Tanagers, Pittas, Sun Bitterns and Bulbuls were tried.

The Brown-breasted Hummingbird (*Amazilia castaneiventris*) laid on several occasions, but the eggs were infertile and it was never certain whether the birds were a pair. The Brown Violet-eared (*Colibri phinae*) nested and reared a chick paired to a male Sparkling Violet-eared (*Colibri thalassinus*). The Golden Tanager (*Tangara arthus*) and the Blue-necked (*Tangara cyanicollis*) both reared young as did the Red-winged Pitta (*Pitta moluccensis*).

Giant toads and Geckos were introduced with a view to controlling a cockroach infestation but with little success. The fish in the ponds include Silver and Grass Carp, Swordtails and Guppies.

Apart from the conservation story of the Hawaiian Geese, which must by now be well known in avicultural circles, the Trust has embarked on a similar project with the White-winged Wood Duck (*Cairina scutulata*) regarded as a much endangered species. There were at Slimbridge several pairs of these birds some fifteen years ago and they lived for several years but never showed signs of breeding.

In 1970, with the aid of the World Wildlife Fund, two consignments of birds were caught in Assam and sent to Slimbridge. These were paired and put into the larger sections of the aviaries; some pinioned and some left full-winged. Nesting-sites in the form of kennels and open-topped boxes were placed 10 ft. high, 2 ft. high and on the ground, 4 alternatives being offered to each pair, though the highest site was omitted in the case of the pinioned birds. In each case a kennel was placed on a log in the winter shelter. Of the 3 clutches laid in 1971 and 1972 two were by a full-winged pair and one by a pinioned pair. The latter and one of the former were in the kennel in the winter quarters. The other of the flighted pair was high up in a willow. The clutches were large, 12 to 14, and the eggs similar in size and shape to that of the Muscovy Duck though they were somewhat darker in colour. The incubation period would seem to be between 32 and 34 days. I issued an edict that the birds were not to be disturbed and the nest not examined until the parent appeared on her pond with the brood. Incubation period and clutch number could wait until the birds were more firmly established. The hatches were successful and in due course the broods appeared on their ponds. It was found that the males spent their time 'dunking' the ducklings and to prevent any drowning they were removed to separate aviary and not returned to their females until the young were fully feathered and had left their mother. Some twenty birds have been reared in the last two seasons. The downies were patterned and coloured like young Mallard, being brown and yellow, a characteristic feature was noted in the way the post orbital stripe turned up at an angle to join the dark cap. Like all cairinini the tarsus was duo-coloured in this case brown and yellow. The juvenile plumage was dark brown where the adult was black.

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THE PLIGHT OF THAILAND'S BIRDLIFE

by RICHARD MARK MARTIN (Padstow Bird Gardens, Padstow, Cornwall, England)

I know that most sincere aviculturists, in spite of what many conservationists say, are really very concerned about the state of wild populations. People keep birds privately because they love them, not because they want to exploit them.

Of course, there are the exceptions—every trade, profession and calling has its black sheep—but notwithstanding this, I feel certain that what shocks me as a conservationist *and* aviculturist will also shock 90% of my fellow enthusiasts, or at least I sincerely hope it will. A friend of mine, Elliott McClure, who is ornithologist with the American Migratory Animal Pathological Survey in Thailand (which is a branch of the U.S. Forces, and works in conjunction with the Applied Scientific Research Corporation of Thailand) has just sent me a report published by the Thai Government.

It is entitled *Animal Exportation From Thailand In 1962-71*, it runs to 100 pages and deals with mammals, birds and reptiles. It is, to my mind, both an important and horrifying publication which demands to be read by all who love Oriental wildlife. It does not set out specifically to shock, but, in fact, if anything, an opposite inference comes through. The opening words of the Introduction read as follows:

Wild animals make up one of the natural resources of the country which are of value to the economy, education and recreation of the people. In the past, Thailand has received millions of Baht income from the exportation of wild animals alone. Many species are in demand and therefore commercial business dealing with wild animals seems to be a real promising one. This has also been beneficial to the circulation of Thai currency within the country.

What follows is true; it is happening now. And in writing this, I sincerely hope that it is not taken for a personal attack on aviculture or aviculturists because it is certainly not intended as such. I merely feel that readers of this journal have a right to know what is going on, and will find the following stimulating and form their own opinions as I have done. The faults lie within the "system": the fact that Thailand is a poor country; the fact that it is (or was) very rich in exotic wildlife; the fact that it is inhabited by Orientals; and, let us be truthful, the fact that world demand (essentially European and American) for tropical animals has proliferated out of all proportion in recent years.

It should be borne in mind that the report is only concerned with those animals which left the country legally via the Don Muang Airport. I emphasise that it does not include animals which have been brought in illegally, and as the report points out: "This [higher priced] group has often been smuggled out for profit".

In 1967 the Royal Forestry Department set up a Wild Animal Inspection Office at the airport, and so data since then has been much more detailed. For the earlier period (1962-6), data was gathered from the records of the Department of Foreign Trade, and is so peripheral that we can almost ignore it. Perhaps the most interesting facts to emerge for that period with regard to birds are that 549 Roulroul Partridges (*Rollulus roulroul*) were exported with the peak being 192 in 1963; 336 Great Argus Pheasants (*Argusianus argus*) were exported, the peak being 126 in 1964, since protection in 1966 their export has been banned. Of the other pheasants 424 were exported; so were 437 hornbills—of which over half were members of the Great Hornbill species (*Buceros bicornis*).

These figures do little to prepare one for what is in store, for no mention is made of the more popular species. Incidentally, in the same period as many as 45,799 monkeys (*Macaca* spp.) were likewise dispatched.

In the table I have listed each species or group of which more than 100 were exported in the five years from 1967-71 together with a few especially interesting types of less than that number.

SPECIES	Number exported					TOTAL
	1967	1968	1969	1970	1971	
Egrets (<i>Egretta</i> spp.)	13	79	13	172	366	643
Ducks (<i>Anatidae</i>)	—	13	17	91	395	516
Kites, hawks, eagles (<i>Accipitridae</i>)	609	714	733	1,184	2,571	5,811
Goshawks (<i>Accipiter</i> spp.)	—	—	—	133	—	133
Falconets (<i>Microhierax</i> spp.)	—	554	1,304	840	515	3,213
Pheasants (<i>Lophura</i> spp.)	214	107	59	74	227	681
Green Peafowl (<i>Pavo muticus</i>)	3	4	20	28	123	178
Roulroul (<i>Rollulus roulroul</i>)	94	99	104	86	192	575
Hill Partridges (<i>Arborophila</i> spp.)	38	51	276	344	249	958
Francolin (<i>Francolinus pintadeanus</i>)	20	—	27	68	356	471
Painted Quail (<i>Cortunix chinensis</i>)	115	1,195	852	329	2,944	5,435
Button Quails (<i>Turnix</i> spp.)	35	10	—	693	425	1,163
White-breasted Waterhen (<i>Amaurornis phoenicurus</i>)	22	46	—	9	85	162
Purple Gallinule (<i>Porphyrio porphyrio</i>)	3	5	11	109	269	397
Bronze-winged Jacana (<i>Metopidius indicus</i>)	—	8	6	45	59	118
Pheasant-tailed Jacana (<i>Hydrophasianus chirurgus</i>)	—	—	6	5	77	88

SPECIES	Number exported					TOTAL
	1967	1968	1969	1970	1971	
Doves (<i>Macropygia</i> spp., <i>Streptopelia</i> spp.)	905	755	1,302	1,260	3,275	7,497
Emerald Dove (<i>Chalcophaps indica</i>)	8	—	208	793	1,204	2,213
Lesser Thick-billed Green Pigeon (<i>Treron curvirostra</i>)	72	262	1,062	890	1,448	3,734
Imperial Pigeons (<i>Ducula</i> spp.), Purple Wood Pigeon (<i>Columba</i> <i>punicea</i>)	28	10	34	37	401	510
Nicobar Pigeon (<i>Caloenas nicobarica</i>)	106	106	738	54	249	1,253
Pigeons (other spp.)	400	2	5	11	60	478
Parakeets (<i>Psittacula</i> spp.)	1,526	9,982	14,249	33,685	79,341	139,783
Moustache Parakeet (<i>P. alexandri</i>)	11	94	278	218	93	694
Green Hanging Parrot (<i>Loriculus vernalis</i>)	350	700	571	415	3,079	5,115
Coel (<i>Eudynamis</i> <i>scolopacea</i>)	12	—	2	31	—	45
Monals (<i>Centropus</i> spp.)	15	4	2	12	14	47
Malokhas (<i>Phaenicophaeus</i> spp.)	—	—	1	2	85	88
Owls (<i>Strigidae</i>)	13	43	393	723	1,323	2,495
Asian Owls (<i>Ketupa</i> spp.)	8	4	26	62	45	145
Kingbirds (<i>Harpactes</i> spp.)	38	132	85	43	253	551
Kingfishers (<i>Alcedinidae</i>)	171	92	150	187	182	782
Tree-eaters (<i>Merops</i> spp.)	—	—	1	2	85	88
Black-billed Roller (<i>Coracias benghalensis</i>)	52	38	130	115	229	564
Scops (Upupa epops)	100	72	198	180	168	718
Hornbills (<i>Bucerotidae</i>)	88	120	95	111	305	719
Great Hornbill (<i>Buceros bicornis</i>)	78	99	128	126	176	607
Barbets (<i>Megalaima</i> spp.)	78	37	161	137	384	761
Oppersmith Barbet (<i>M. haemacephala</i>)	49	92	172	308	368	989
Woodpeckers (<i>Picidae</i>)	124	136	724	275	560	1,819
Woodbills (<i>Eurylaimidae</i>)	—	13	56	72	20	161
Tit (Pitta spp.)	75	71	327	542	741	1,756
Leafbirds (<i>Chloropsis</i> spp.)	647	1,014	1,161	1,654	3,112	7,588
Blue-winged Leafbird (<i>C. cochinchinensis</i>)	10	20	12	6	63	111
Grey Bluebird (<i>Irena puella</i>)	367	781	718	2,317	2,185	6,368

SPECIES	Number exported					TOTAL
	1967	1968	1969	1970	1971	
Bulbuls						
(<i>Pycnonotidae</i>)	1,082	1,172	2,070	4,245	4,289	12,858
Drongos (<i>Dicrurus</i> spp.)	7	11	43	123	179	363
Orioles (<i>Oriolus</i> spp.)	39	119	86	215	353	812
Black Racquet-tailed Treepie						
(<i>Crypsirina temia</i>)	8	14	29	237	300	588
Rufous Treepie						
(<i>C. vagabunda</i>)	—	—	16	120	121	257
Hunting Cissa						
(<i>Cissa chinensis</i>)	118	160	389	155	164	986
*Laughing Thrushes						
(<i>Garrulax</i> spp.)	289	996	946	1,019	2,782	6,032
White-crested Laughing Thrush (<i>G. leucolophus</i>)	178	—	634	996	75	1,883
Babblers (other spp.)	—	60	23	75	502	660
Magpie Robin						
(<i>Copsychus saularis</i>)	28	145	190	312	340	1,015
White-rumped Shama						
(<i>C. malabaricus</i>)	331	442	1,033	1,563	4,065	7,434
Tailorbirds						
(<i>Orthotomus</i> spp.)	—	132	—	2	140	274
Flycatchers						
(<i>Muscicapa</i> spp.)	—	—	226	6	9	241
Talking Myna						
(<i>Gracula religiosa</i>)	34,406	43,049	28,111	32,804	61,964	200,334
Starling (<i>Sturnus</i> spp.)	465	1,162	1,387	2,726	3,776	9,510
Glossy Starling						
(<i>Aplonis panayensis</i>)	5	53	156	176	326	717
Sunbirds						
(<i>Nectariniidae</i>)	280	308	217	429	2,162	3,396
Scarlet-backed Flowerpecker (<i>Dicaeum cruentatum</i>)	8,123	2,505	6,666	3,846	13,534	34,674
Flowerpeckers (other spp.)	—	14	100	163	160	437
White-eyes						
(<i>Zosteropidae</i>)	157	283	685	561	2,313	3,999
Weaverbirds						
(<i>Ploceus</i> spp.)	736	23	763	10,486	9,832	21,840
Pin-tailed Parrotfinch (<i>Erythrura prasina</i>)	17,992	38,192	56,931	108,299	195,814	417,228
*Munias (<i>Lonchura</i> spp.)	8,378	9,950	16,115	17,917	56,259	108,619
Chestnut Munia						
(<i>L. malacca</i>)	15,306	19,695	24,761	20,362	16,120	96,244
Tree Sparrow (<i>Passer montanus</i>)	—	340	319	451	571	1,681

*=see species immediately below.

It is clear which species suffer the heaviest predation from human trappers. The case of the Pin-tailed Parrot Finch (Nonpareil) aptly spotlights the overall picture: from a large enough figure of 18,000 in 1967, this all but doubled each year until 1971—when a phenomenon

number of nearly 196,000 or 538 every single day were exported, making a grand total of over 417,000 for the five years at an average of 83,446 every year. This species suffers most it would seem; another hard-pressed bird is, perhaps predictably, the popular so-called Talking Mynah—of which on average over 40,000 are exported each year, with a record number of nearly 62,000 in 1971.

There are no figures available yet for 1972, but I see no reason to believe why this figure should not jump up again. The case of the Mynah is particularly sad as few are ever bred in captivity—over 99% of the 100,334 exported from Thailand over the last five years are sure to be living unproductive solitary lives.

Parrots of the *Psittacula* genus (these include the Alexandrine Parakeet *P. eupatria*), Blossom-headed Parakeet (*P. cyanocephala rosa*) and the Grey-headed Parakeet (*P. himalayana finschii*) have also been subjected to increased export trafficking: from little over 1,500 in 1967, the figure has rocketed to one approaching 80,000 for the year 1971 (which is nearly 20,000 more than the sum of the preceding four years).

Munias, even excluding the Chestnut Munia, have been exported over the period at an average of nearly 22,000 p.a., with well over half (56,259) the sum total (108,619) being handled in 1971. The Chestnut Munia almost equals that figure on its own with on average a steady 19¼ thousand leaving Thailand each year.

Other figures which struck me as being particularly disturbing were those for the Scarlet-backed Flowerpecker and birds of prey—of which numbers in excess of 13,500 and 3,000 respectively were exported in 1971. The numbers of owls to leave Thailand increased from a mere twenty-one in 1967 to 1,368 in 1971. 15,685 doves and pigeons were exported in the period, together with no mean totals of 782 kingfishers, 1,326 hornbills, 819 woodpeckers, 1,750 barbets, 1,756 pittas and no fewer than 6,368airy Bluebirds were similarly sent out.

Apart from the birds I have listed in the table, the report also covers any other species—which appear to be less prone to exploitation and are exported in more reasonable numbers. By and large the current progress of this "boom business" is easily deduced from the 1969–71 figures. Over those three years, an average of 210,248 birds were exported legally from the Don Muang Airport each year.

Figures such as these must concern even the most hardened aviculturist. Early we have a lot of work to do if aviculture (the foreign-bird branch) is to remain a respectable occupation. It is my personal opinion that there has got to be changes, and many foreign-bird enthusiasts are going to have to try a lot harder to breed their own stock replacements—for it is surely our responsibility. We cannot continue to be consumers of birds in this wholesale manner. Aviculture, for its own good, must change with the times: already, and many would say not before time, Thailand along with many other tropical countries is tightening the screws on her wildlife drain.

As a matter of interest, over the same five years, 35,500 primates (including over 6,000 Common Tree Shrews (*Tupaia glis*) and 900 Slow Lorises (*Nycticebus coucang*)) were exported legally; so were 1,128 Leopard Cats (*Felis bengalensis*), 1,129 Otters (*Lutra* spp.) and 1,152 bats. Altogether a total of some 52,000 mammals were exported of many different types.

The records for reptiles also showed up some high trafficking: for instance, 61,255 Turtles; 38,644 Snakes; 259 Crocodiles and 40,255 Lizards.

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FURTHER NOTES ON THE BEHAVIOUR OF PAINTED QUAIL

Excalfactoria chinensis

By C. J. O. HARRISON (Berkhamsted, Herts., England)

About a year ago I had the opportunity to keep Painted Quail *Excalfactoria chinensis*, again and to make further observations on their behaviour at close quarters. These have added a few interesting facts to those already recorded (Harrison 1965, 1968; Harrison, Restall and Trollope 1968).

A pair of quail was given to me for observation by Mr. J. Dowling. The female had developed an odd affliction which caused her constantly to fall over. I lacked accommodation for birds at the time and therefore kept the quail in the room where I was working, converting a shallow cardboard box about 3 ft. \times 2 ft. \times 1 ft. high by covering the open top with gauze panels and inserting a long glass panel into the side of the box. This makeshift cage rested on a bench just below a large window.

The female's trouble appeared to be due to some injury which had impaired her sense of balance so that whenever she turned her head to the left or looked around sharply, she fell backwards. Apart from this she appeared normal. In an attempt to help, and to watch her progress I made an imitation thicket with thin, upright strips of stiff card projecting an inch or two apart from a solid base. With these to support her when she staggered, the female moved around with reasonable agility. Unfortunately she succeeded in wedging herself in the water-pot during a fall and in my absence drowned herself. The male commenced the usual calling that occurs in isolation or when the female is not visible; and as soon as possible I provided him with another mate.

THE CROUCHING WALK

Although I had not seen evidence of a furtive way of walking in these or other Painted Quail in indoor situations or when they were on the floor of a shed, the relatively shallow and open-topped box near a large window apparently created an artificial "open space" situation. The birds, when

moving across the box, would use a crouching posture appropriate to such situation. The birds moved slowly, with the legs flexed so that the body feathers were almost touching the ground. The body was horizontal and the head held low, the top of it in line with the back. The movement was smooth, lacking the more jerky, head-nodding motion of the normal walk. This smooth movement is the one referred to previously (Harrison 1965) which, seen from above, gives the impression that the bird is gliding along on wheels rather than legs. When almost to the further side of the box the bird would abandon this slow movement for a sudden rush to the "cover" of the wall.

A bird suddenly introduced into a box or bare space of this kind may show a similar stance, but half-squatting, with the legs flexed, but the body more upright and the head raised. In this posture it may move around in abrupt, short rushes and, until it relaxes, gives the impression that it has sustained some kind of injury.

ALARM CALL?

In addition to this fear of open space the quail also showed constant nervous awareness of the passage of larger birds, such as rooks and jack-jaws, outside the window. The rapid ticking or reeling call which I had previously suspected to be an avian predator alarm was sometimes heard in such circumstances. This call, which was usually followed by a short period of complete silence and motionlessness, also occurred occasionally in response to some external sound, such as the sudden shrieking alarm of a blackbird outside the building, although no cause for fear was visible. However, on one or two occasions a sudden bout of this reeling was followed by the male dashing in circles round the female with plumage fluffed and wings drooping in display, suggesting that the call may have a broader function than is at first apparent.

ROOSTING

In order to give the birds a greater sense of security I added a number of grass tufts at one end of the box. The most immediately noticeable effect was on their roosting behaviour. The pair roost side by side with the hinder ends of their bodies pressed together so that the head ends diverge slightly, or side by side facing in opposite directions, sometimes pressed together so tightly that they appear like one ball of feathers. Hitherto they had normally roosted towards one corner of the box but in the open. When the added tufts provided cover in this area they used the cover almost continuously during the day, but at night they moved to the bare half of the box where they still roosted in the open space.

THE THROAT PATTERN AS A SIGNAL

The grass tufts, with earth still on the roots, had been arranged so that they provided a fairly level roof of drooping blades about 5 ins. above the

ground and left small tunnels between the bases of the tufts. The bird quickly utilised these and after thorough exploration both birds, but particularly the female, spent much of the time squatting in small hollow which also gave a wide view of the box. When the birds were using the grass tuft area one aspect of the plumage became more apparent. The throat of the female is unpatterned and pale, but the male has a bold black and white pattern restricted to the throat and lores. When the birds were creeping through the grass tunnels they would raise their head at intervals, pushing them up through the grass-blades and looking around. In this posture the bill was tilted upwards and what showed most conspicuously above the grass was the throat area which, when the remainder of the bird was concealed, provided as immediate signal indicating both the species and sex of the bird. It may be that the bold pattern restricted to the face and throat is related in this species and perhaps in other gamebirds, to this aspect of visibility in a grassland habitat.

NEST-CALLING

The second female I put with the male was a young one beginning moult and it was a month or two before she showed any tendency to nest. During the greater part of this period the male performing intermittent bouts of nest-calling (or "cornering" as it is sometimes called in behaviour studies). In performing nest-calling the male would squat in a corner or hollow, facing outwards, with the breast lowered and the tail end sometimes raised in the air. Various scraping and scuffling sounds could be heard but it was not possible to see what foot-movements occurred.

This posture was accompanied by a low-pitched, subdued and mournful note constantly repeated. It sometimes appeared to be a monosyllabic "quoor, quoor, quoor" repeated an indefinite number of times, but on other occasions was a disyllabic "quoror, quoror, quoror". Since the birds were with me in a rather small room every sound was audible, but a week or two elapsed before I realised that a series of sounds which occurred while the male was uttering the mournful note did not, in fact, emanate from the female but were made by the male concurrent with the other call. This second series of notes was a subdued twittering, much higher in pitch than the long-drawn plaintive notes and slightly harsh in tone. It appeared wholly independent on the other call but careful listening revealed that there was at times a similar cadence in the two. There are records of several sounds being uttered simultaneously during song in a number of bird species, but this performance by the Painted Quail would seem to be exceptional even in this context.

The female took little or no notice of the male's behaviour, but once when she walked towards him while he was calling, and several times when she appeared to come on him suddenly by accident, I saw him flatten himself on the ground, half-spreading his wings and turning his head sideways towards the female so that the throat pattern was visible from above.

accompanying this by a soft, rapidly-repeated "wit-wit-wit-wit" call. This posture was described before (Harrison 1965) as an apparently more extreme form of tidbitting.

NEST BUILDING

When the grass tufts had been put into the box the male usually called from a hollow among them, although he sometimes chose a useless site such as the narrow crown of a tuft where any egg would immediately have rolled away. Before the grass had been put in he used corners of the box, or the very slight overhang when the loose paper forming the floor of the box lay up against the side and drooped over at its upper edge creating a hollow with slight shelter above.

After a bout of calling the male would often stand on the site stretching upright and looking upwards, or pecking at the side wall, as though he expected to find something there. This first occurred during late winter when long grass was not available and so I took a strip of paper 7-8 inches wide and cut it deeply along one edge to produce a tall fringe of upstanding, grass blade-like strips. When I placed this on edge and partly surrounding one of his sites with it, he called there and then began reaching up and grasping these false grassblades at or near the tip, pulling them down towards him and then releasing them. Very shortly a number were drooping inwards over the site and it is obvious that in a wild state this behaviour would result in growing herbage arching over the nest-site and concealing it from above.

Little other evidence of nest-building was seen until the female laid her first egg when, about an hour before the event, she squatted in a hollow in the grass and began frenziedly sideways-throwing, seizing small pieces of grass or debris and with a quick sideways flick of the head throwing them back to one side of her or the other. She did not lay consistently, and the male started eating the eggs, destroying them within minutes of their being laid. On the few occasions that I was able to make observations eggs were laid between 15.30 and 16.00 hrs.

CARE OF YOUNG BY MALE

The behaviour of this male spoilt any hopes of observing a full nesting cycle, but in recent observation on adults with small chicks, belonging to other aviculturists, I was interested to observe that the attention which the male devotes towards the female and brood includes the brooding of the young chicks, with plumage fluffed in similar fashion to the female's.

REFERENCES

- HARRISON, C. J. O. 1965. Plumage pattern and behaviour in the Painted Quail. *Avicult. Mag.*, **71**: 176-184.
 HARRISON, C. J. O. 1968. Some notes on the behaviour of nesting Painted Quail, and some further notes on their calls. *Avicult. Mag.*, **74**: 7-10.
 HARRISON, C. J. O., RESTALL, R. & TROLLOPE, J. 1965. The egg-rolling behaviour of the Painted Quail. *Avicult. Mag.*, **71**: 127-130.

APPARENT SEXUAL DIMORPHISM IN THE CALL OF THE BROWN FISH-OWL

(*Ketupa zeylonensis*)

By C. J. O. HARRISON (Berkhamsted, Herts., England)

At the London Zoo at dusk on 16th June 1973 I was able to observe the calling behaviour of an apparent pair of Brown Fish-Owls, *Ketupa zeylonensis*. The two birds were perched side by side, facing me; and when first observed the presumed male had partly turned towards the other bird. The feathers of its throat were puffed out and formed a large rounded white mass immediately below the bill, the tips of the ruffled feathers projecting a little further than the bill. Normally this white area shows as a thin, inconspicuous whitish band across the throat, streaked with darker colour.

In addition to inflating the throat the bird had also brought the "ear tufts" into display. In this species these elongated tufts of feather normally lie flat over the eyes, the tips projecting laterally. They had not been raised like those of other owl species, but appeared to have been ruffled and brought forwards so that they formed prominent shaggy brows projecting above the eyes.

In this posture the bird uttered a very deep and surprisingly soft "hu-hu", the first syllable a little more emphatic than the second. The presumed female immediately responded by inflating her throat, a large white patch appearing where none had been apparent previously, and uttered a trisyllabic call "hu-hu-hu", with the first note also slightly stressed and the other two following at shorter intervals than in the call of the first bird. When the call was complete the throat deflated and the white patch disappeared; but the other bird retained the inflated throat when silent.

The calling was repeated a number of times with the same ceremony. The two calls followed each other in such a consistent succession that to anyone not witnessing the performance it might have sounded like a five-note call from a single bird. The most striking feature was the quietness of the call-notes. From references in literature it would appear that they carry well, but heard at close quarters it seemed improbable that they would carry further than some 50 metres.

The species shows similarities to the typical Eagle Owls. A white throat patch, inflated when calling, is also present in owls of the genus *Bubo*; and Philip Wayre (*pers. comm.*) has noted sexual dimorphism in the call-notes of the Great Eagle Owl, *Bubo bubo*, the male having a monosyllabic call and that of the female being disyllabic.

References in literature to the call of the Brown Fish-Owl vary. Whistler (1941) refers to "a deep triple *hu-who-hu*". Salim Ali and Ripley (1969) seem aware of both calls, describing "a deep hollow-sounding

boom-boom or *boom-o-boom* with a peculiar reverberating ventriloquistic quality"; but only G. M. Henry (1955) seems aware of possible sexual difference, stating that they "... call to each other in doleful and most human-sounding moans; *oomp-ooo-oo* says one, to be answered by its mate with an asserting *oo*".

Owls are not easy birds to observe in the wild and it is probably only under aviary conditions that some problems of their vocabulary will be elucidated.

REFERENCES

- LI, S., and RIPLEY, S. D. 1969. Handbook to the birds of India and Pakistan. Vol. 3. O. U. P. : London, Bombay, New York.
 HENRY, G. M. 1955. Guide to the birds of Ceylon. O. U. P. : Oxford.
 WHISTLER, H. 1941. Popular handbook of Indian birds. Oliver & Boyd : Edinburgh.

* * *

NEWS AND VIEWS

We have received from Professor Cade at Cornell University the report of the captive breeding programme on birds of prey, together with some ancillary literature. Considerable effort has been directed to experiments in artificial insemination, using captive birds with psychological fixation on their owners, and there has been some success. In 1972, using artificial incubation and then allowing adult to rear young, or hand-rearing young, one Golden Eagle, four Lanner Falcons and one Harris's Hawk were raised, the eagle being the result of artificial insemination. This is, however, from sixty-six eggs, twelve of which hatched. The publications are being placed in the Society's library at the Linnean Society.

* * *

Members will have heard with regret of the death of Mrs. N. Howard, well-known for her collection of parrots and her successes in breeding them. Only last year she had bred for the first time in Britain the Hawk-headed Parrot, a breeding for which the Society's medal has been awarded. We understand that Mr. Howard, also a member of the Society, will continue to maintain the parrot collection.

* * *

Following the publication of the account of breeding the Red-fronted Parbet in the magazine earlier this year we hear from Kerry Muller, now at Taronga Zoo, Sydney, that he was successful in breeding this species when curator at the National Zoological Park, Washington, D.C. 1969.

* * *

According to *The New Scientist*, Professor Jewell of London University put forward at a recent meeting the theory that the key feature of domestic animals (presumably including domestic birds) is that they have lost the ability to respond to adverse conditions that would suppress breeding in the wild progenitors. Selection under domestic conditions will have favoured those individuals which will breed in spite of everything. While this may seem satisfactory to the average aviculturist it could have interesting implications for those who claim that we can maintain and increase wild populations by captive breeding, followed by release of surplus birds.

* * *

Peter Olney writes . . . "the Blue-backed Manakins at the London Zoo which reared a young male in 1972, reported in the magazine earlier this year, have unfortunately not repeated their success this year. One egg was laid in late April on the bare top of the heating pipe grill and, not surprisingly, was later found to be cooked. Then, in the middle of June two partially-fledged young were picked up dead at the back of the Tropical House. Obviously they had left the nest too early, as did the original first youngster reared in 1972. Regretably it was not known that the female was sitting, for no nest was, or has been, found and she was always on view when we were in the house.

It may be of some interest to record that a hybrid was produced, to an embryo stage, by a female Active (Black-billed Jamaican) Parrot, *Amazona agilis*, and a male White-browed (Spectacled) Parrot, *A. albifrons albifrons*. Unfortunately the egg was abandoned after 14 days."

* * *

With the six adults he now has Len Hill has succeeded in breeding more than fourteen Mountain-witch Doves. This rare Jamaican species is one of the more beautiful of the doves and it is to be hoped that through Mr. Hill's efforts it may now become more widely established in aviaries and zoos.

* * *

Comments have been made in the past concerning unlikely species found with the Society's waterfowl rings on them. The latest is a kestrel found by someone in north-east London with ring number 714.

* * *

During discussion of the effect of light on bird breeding cycles at a recent conference an attempt was made to relate this to the aviculturists' problem of migratory native species that may come into breeding condition too early if given too much light during winter. Dr. R. Murton's advice was that if the daylight in the bird's wintering area is unknown it is best to play safe and stick to a less than 12 hour day in winter. Since experiments show that a brief period of illumination during the hours of darkness each night can have a similar effect to a long day in stimulating a bird's breeding responses it seems inadvisable even to switch the lights on once the birds have gone to roost.

* * *

Peter Brown writes from the Harewood Bird Garden . . . " Our most interesting breeding to date this year has been that of four Ypecaha Wood Rail which are now half grown and scampering all over their aviary with their parents. This is one of the tallest of the Rails, standing 18 in.-2 ft. and not at all secretive like most Rails. They are eating mostly live food and a little beef.

Ringnecks and imported Redrumps have young as do Peach-faced and Scher's Lovebirds. Penguins were again a disaster with six hatched but none reared. The oldest lived for two weeks on hand-rearing but then died. We have tried a variety of food substances, but we cannot come up with the complete answer. Invariably the parents let their young die within a week.

The pheasants have been very erratic in fertility with Coppers, Mikados, Pouter's and Bar-tails all being clear but Swinhoes and Brown-Ears are very infertile and we have seven young at present.

We have likewise had good hatches with Bar-head, Snow and Barnacle Goose and Bahama Pintail.

We have three pairs of Snowy Owls sitting and are keeping our fingers well and truly crossed, and Barn Owls have three young.

Last year we sent some Californian Quail from America. These birds have been paired to our own birds and we now have dozens of young quail. Fertility has been excellent.

One interesting pair is a male Roseate Spoonbill which has paired up with a Scarlet Ibis. They have built a nest and the Ibis is now sitting. It would be nice to produce a Scarlet Spoonbill. "

C.J.O.H.

* * *

JAMES BAILEY

Members will be very grateful to learn of the legacy of £100 made to the Society in the will of the late James Bailey, Hon. Life Member, who died in April this year aged 87.

Jim Bailey, who worked at London Zoo for 44 years, latterly as Overseer of Birds, was a very gifted aviculturist and many Members will have benefitted from his knowledge and long experience. Among his many achievements was the establishment of the Hummingbird House at London Zoo and particularly his invention of the glass feeding tubes, still used today, whereby humming birds were successfully kept alive for the first time in Europe.

Jim's death will have saddened many friends and Council would like to record its appreciation for his contribution to aviculture and his support and interest in the Society.

H. J. HORSWELL.

* * *

CORRESPONDENCE

REQUEST FOR INFORMATION REGARDING NAMES GIVEN TO PET BIRDS

I have been commissioned to write a book on the origins of pet names of all kinds.

I am particularly anxious to have a good selection of bird names, and would be very grateful if members of the Avicultural Society who keep birds as pets would kindly write to me briefly giving the names of their bird or birds and the reason for the choice.

I should naturally also appreciate receiving particulars of the species of bird and short description of its colouring, together with any characteristics which may have led to the name being given.

Any information sent will be duly acknowledged.

ADRIAN ROOM.

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The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

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THE AVICULTURAL SOCIETY

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White-collared Manakin (left) Long-tailed Manakin (right)

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SEPTEMBER-OCTOBER 1973

NOTES ON THE WHITE-COLLARED MANAKIN AND LONG-TAILED MANAKIN

(*Manacus candei* and *Chiroxiphia linearis*)

By DR. DAVID SNOW (Tring, Herts., England)

The accompanying plate shows the males of two Central American manakins, the White-collared Manakin (*Manacus candei*) and the Long-tailed Manakin (*Chiroxiphia linearis*). These small fruit- and insect-eating birds, of about the size of tits, belong to a tropical American family and are not to be confused with the seed-eating mannikins of the Old World tropics. They are most remarkable for their courtship displays, which are unsurpassed in complexity and variety.

Males of the White-collared Manakin gather at leks, traditional dancing areas on the forest floor, where each male clears for himself a "court" two or three feet across, from which he removes all fallen leaves and any other debris light enough to be carried away. The basic element of the display consists of rapid leaps, each accompanied by a loud snap of the wings, to and fro between upright perches on either side of the court. Occasionally the bird leaps down to the bare ground of the court and up again, with a curious grunting sound, to a higher position on the same perch. The females visit the males at their courts and mating takes place on one of the upright perches beside the court. The bird in the plate is shown preparing to make a jump from one upright perch to another. The white throat feathers are puffed out forwards so that they project as a beard beyond the tip of the short beak.

The Long-tailed Manakin displays quite differently. Pairs of males take part in a perfectly coordinated dance on a horizontal or slightly sloping perch two or three feet above the forest floor, usually in a place where the undergrowth is thick and observation difficult. In this display the basic element consists of a jump, with fluttering wings, head held low, and long tail feathers drooping, accompanied by a curious vibrant call reminiscent of the twanging of a jew's harp. The two birds jump alternately; as one lands the other jumps up, and the perfectly timed alternate jumps, with the rhythmic twanging, may continue for half a minute or more. When a female visits the display perch the two males chase her, and the jumping then takes the form of a Catherine wheel

revolving before her; as one male jumps he moves back in the air, while the other hitches himself forward to take his place, jumping as the first bird lands.

Both of these manakins have traditional sites for their displays, which apparently persist as long as the forest remains undisturbed. Male and female have little to do with one another except at the time of mating. The female alone builds and attends the nest, which is a slight hammock-like structure slung in a horizontal fork of some low plant. The normal clutch is invariably two eggs, whitish in ground colour with fairly thick brownish streaks and mottling. The eggs hatch in about 19 days and the nestlings remain about 14 days in the nest.

* * *

RECENT PARROT BREEDINGS AT THE SAN DIEGO ZOO

By DR. JAMES M. DOLAN, JR., Director of Animal Sciences
(San Diego, California, U.S.A.)

Psittacines represent the largest single family of birds exhibited in the San Diego Zoo. They have long been a speciality of the collection and a number of species and subspecies have reproduced here for the first time in captivity or in the United States. Between 1st January 1972 and 30th March 1973 a substantial number of hatchings have taken place. Certainly the most important is that of a Red Shining Parrakeet, *Prosopeia tabuensis splendens* on 4th March 1973. Unfortunately this bird died on 10th April 1973. Two previous clutches were laid by the hen but these were all infertile. The first clutch consisted of four eggs, the second three and third three. The adult group of birds is comprised of four males and a single female captured in June of 1970 at Kavala Bay, Kandavu, Fiji Islands. Three males and the female occupy an aviary twenty feet long by six feet wide by seven feet high in which are hung two standard grandfather clock nests. All four birds have proven to be very compatible, and there has been no fighting within the group. Oddly enough, these birds have never exhibited any noticeable breeding display. The hen has always spent a great deal of time in the nesting box, as has been our experience with hen *Eclectus*, so it is not possible to give an exact incubation period. The fourth male Red Shining is housed with a pair of Masked Parrakeets, *Prosopeia personata* and as in the case of the Red Shining group, all three birds are compatible. As far as we are aware this is the first successful rearing of a Red Shining Parrakeet in captivity. Two further subspecies of *P. tabuensis* are kept in the collection: *P. t. tabuensis*, which to date have shown no inclination to nest; and *P. t. koroensis*, which have laid two clutches of infertile eggs.

Of almost equal interest is the hatching of a Blue-crowned Lory, *ini australis* on 29th March 1973. The parent birds arrived on 21st November 1970 from Apia, Western Samoa among a group of five, of which they are the only survivors. This pair of birds produced three previous clutches of infertile eggs. Again we believe this to be a first aptive hatching.

Other hatchings among the lories and lorikeets during the 1972-1973 period are as follows: one Red Lory, *Eos b. bornea*; four Forsten's Lorikeets, *Trichoglossus h. forsteni*; two Edward's Lorikeets, *T. h. capistratus*; 13 Red-collared Lorikeets, *T. h. rubritorque*; 20 Ornate Lorikeets, *T. ornatus*; 1 Scaly-breasted Lorikeets, *T. c. chlorolepidotus*; 17 Perfect Lorikeets, *Psitteuteles euteles*; 14 Mt. Apo Lorikeets, *P. johnstonae*; two Iris Lorikeets, *i. iris*; three Blue-thighed Lories, *Lorius lory erythrothorax*; nine Yellow-backed Lories, *L. garrula flavopalliata*; and 11 Musk Lorikeets, *Glossopsitta cinna*.

Several interesting hybrids have also been hatched. One Buru Red Lory, *Eos bornea cyanonothus* × Swainson's Lorikeet, *Trichoglossus h. luccanus*. This particular bird closely resembles Mivart's plate (1896) the hybrid Gray's Lorikeet, although the parentage is quite different. It has proven to be a hen and is now paired with a cock Red-collared Lorikeet. Since the hybrid bird is a generic cross, it will be interesting to see if it proves fertile. Four Scaly-breasted, *Trichoglossus c. chlorolepidotus* × Meyer's Lorikeets, *Psitteuteles flavoviridis meyeri* have been hatched since 22nd November 1971. These birds closely resemble the male parent except they are somewhat smaller, more plump and unlike the male have yellow rather than red under-wing coverts. One of these is now paired with an Iris Lorikeet. A hybrid Black-winged, *Eos cyanogenia* Red Lory, *Eos b. bornea* was hatched on 2nd February 1973. It is too early to tell what this bird will look like when it is fully feathered, but for the present it has begun to grow black feathering on the head and wings like the male parent.

REFERENCE

MIVART, ST. G. 1896. A monograph of the lories. R. H. Porter: London.

* * *

ON COURTSHIP DISPLAYS AND THE TAXONOMIC POSITION OF THE GREY-HEADED SILVERBILL

(*Odontospiza caniceps*)

By LUIS F. BAPTISTA

(Museum of Vertebrate Zoology and Department of Zoology,
University of California, Berkeley, California, U.S.A.)

Until the study of Güttinger (1970), the Grey-headed Silverbill (*Odontospiza* [*Lonchura*] *caniceps*) was one of the least known of the mannikins (*Lonchurae*). Between January 1971 and March 1972 I kept two wild caught pairs of these estrildids, as well as four males and two females which were hatched and raised in my home by Striated Finches (*Lonchura striata*). I made previously unreported observations on the behaviour of these individuals. Some of these observations appear to be of taxonomic importance. In describing displays, the terms "inverted curtsy", "lateral pivoting", and "leap-frogging" used throughout this paper, are after Morris (1957).

Each breeding pair was kept alone in a cage measuring 22 in. \times 18 in. \times 21 in. When not breeding, they were kept in a cage 22 in. \times 36 in. \times 49.5 in. along with some other estrildids. The birds were colour-banded for individual recognition.

COURTSHIP DISPLAY

Güttinger (1970) describes the courtship display of this species as follows: The male grasps a grass stem by one end in the manner of many other estrildids. He flies before the female, then performs inverted curtsies accompanied by song. The inverted curtsy is a bobbing movement in which the main component is an upward thrust imparted by straightening of the legs. The female then performs inverted curtsies in synchrony with the male, but without song or a grass stem. After a while the male drops his grass stem, and turning his bill and tail in the direction of the female, sings his long song. The male's display is often accompanied by bowing (the "low twist posture" of Moynihan and Hume, 1954), which in turn often passes to displacement bill wiping. The above ceremony may also be initiated by the female, if she flies before the male and begins inverted curtsies. This display is infrequently, though regularly, performed during pair-formation and before the laying of the first egg. In contrast to most other estrildids, the inverted curtsy display of this mannikin has never been observed to lead to copulation. Frequently the display is followed by allopreening, or both partners feed. Güttinger (1970: 1052) has suggested that this display functions to stimulate and synchronize mated pairs.

The display of my wild-trapped male Left-Yellow (LY) was as follows: with bill mandibulating and pointed at an angle skywards, head and tail turned towards the female, and belly slightly fluffed, LY would sing his song. If the female changed perches, he would follow her, keeping the same posture and continuing to sing whenever he landed next to her. If she remained still, he would approach her in short hops, while still singing and posturing. Sometimes the female would respond with tail flicking in typical estrildid manner. Irrespective of the female's behaviour, the male would often fly on her back, attempting to copulate. Usually he would leap-frog off. Only on one occasion did copulation succeed.

LY's display was similar to the second part of the display described by Güttinger (1970). The position and movements of the bill were similar to that seen in solitary song (Güttinger, *loc. cit.*), however, the lateral pivoting movements of the head were absent. Only on one occasion did LY perform inverted curtsies during courtship. Although there were always grass stems in the cage which LY utilized in nest-building, these were never used in display.

The display of my second wild trapped male, Left-White (LW), differed markedly from that of LY. His display may be divided into the following two parts: (i) the submissive courtship portion (terminology after Goodwin, 1965) and (ii) the inverted curtsey portion. The first display was usually followed by the second, although each could be performed without the other.

Submissive Courtship. In this display, the male crouched on a perch next to the female. The feathers of the belly were fluffed and covered most of the legs with only part of the toes showing. Its body was bent slightly away from the female. With head and sometimes the tail pointed in her direction, with bill wide open, and tongue protruding and moving back and forth, the male sang to her. Frequently, the male's wing distal to the female was flicked out and in very rapidly several times during singing (Fig. 1). A second male, Right-Black (RB), the offspring of LW, was observed performing this display twice. This display is similar to that described for other estrildids, for example, the species of *Uraeginthus* (Goodwin, 1965). In the Red Avadavat (*Amandava amandava*), a similar display is given, but only to strange females (Kunkel, 1959; Goodwin, 1960).

Inverted Curtsey. After a period of singing in the crouched position, the LW erected himself. With bill still wide open, tongue still protruding and moving back and forth, head and tail pointed towards the female, and belly feathers slightly fluffed, the male performed inverted curtsies. At higher intensity the body was bent away from the female (Fig. 2) and inverted curtsies were alternated with lateral pivoting movements of the body. When performing inverted curtsies, the male slowly approached the female in a series of small hops. Sometimes he

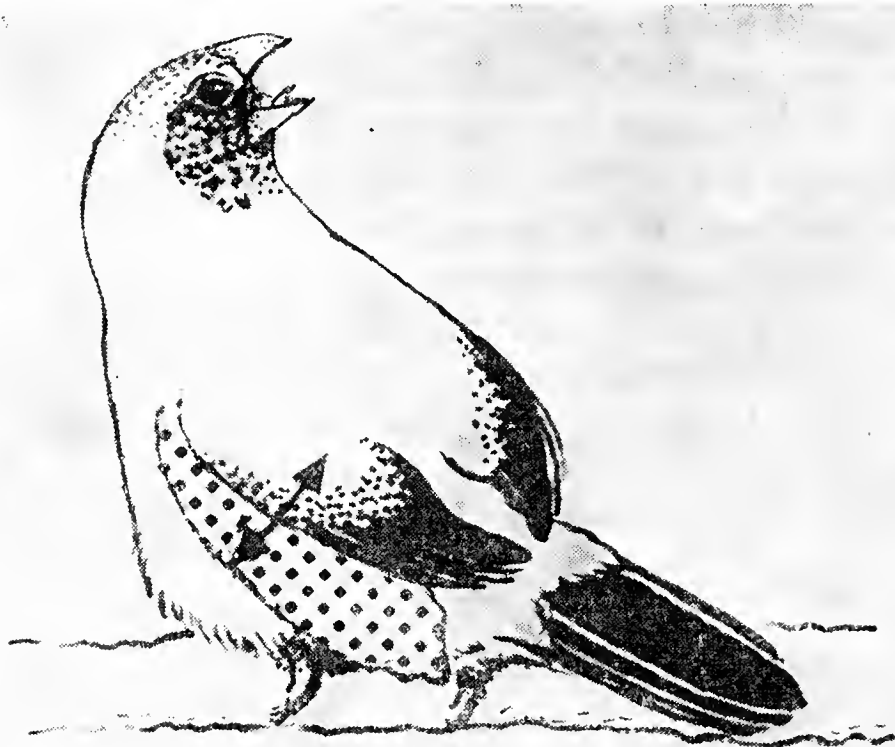


FIG. 1

A Grey-headed Silverbill in submissive courtship display. Note the tongue protruding from beneath the belly feathers, the wide open bill, protruding tongue and the flicking left wing.

danced away from the female. Inverted curtsies were interspersed with bows and or displacement bill wipes. Sometimes the male merely nodded at the female, probably an intention movement to bow (Morris 1958). On a few occasions, double bows were observed, one bow followed immediately by another. As in submissive courtship display, the wing distal to the female was often flicked out and in very rapidly. On one occasion (19th February 1972) the wing was also quivered as in juvenile begging display (Güttinger, 1970).

The female sometimes responded with inverted curtsy displays. On rare occasions this was followed by tail quivering. Copulation was observed only twice (see below).

LW and LY's displays could be elicited by reintroducing their female to them after a short period of separation. When not breeding, LW would display to any strange conspecific, irrespective of its sex, when the latter was introduced into the cage holding him and his mate. When breeding LW would ignore or attack strange conspecifics introduced into its breeding cage.

Three other males, offspring of LY, were observed performing stereotyped displays as described by Güttinger (1970). These were never at high intensity, as observations were made when the birds were still juveniles.

COPULATION

At 6.47 p.m. on 9th February 1971 a successful copulation was observed between male LY and his mate Right-Red (RR). I was sitting about 3 ft. from their breeding cage when I heard LY complete two songs. I looked up to see LY on RR's back, his wings fluttering rapidly and tail thrust under hers in the act of coition. After dismounting he flew back and forth between two perches placed $1\frac{1}{2}$ ft. apart. He next flew beside the female, and both birds then engaged in displacement utopreening. At 6.54 p.m. the same day LY performed the same display described earlier. He flew on his mate's back in an attempt to mount her but she did not respond. RR laid her first egg on 15th February 1971.

On 1st January 1972 male LW was observed performing high intensity display to his mate (unbanded). She solicited with tail quivering, her head was slightly upturned and bill wide open. The male leap-frogged over her back four times, but no copulation ensued.

A copulation was observed between the same pair on 12th February 1972. The male displayed at full intensity, and the female solicited copulation with the tail quivering, her head slightly upturned, and bill wide open. After leap-frogging off her back twice, the male finally mounted. He stood perched on her back with tail widely spread for a few seconds, during which time the female's tail was still quivering. He finally copulated with her. After he had dismounted and flown to another perch, the female was seen performing inverted curtsies. At 12 noon on 17th February 1972 LW displayed to his mate at high intensity and the female solicited with tail quivering. The male leap-frogged off her back once, then copulated with her. The female performed displacement bill flipping after coitus, and the male preened his belly.

DISCUSSION

There appears to be individual variation in the displays of Grey-headed Silverbills. Whereas inverted curtsies were always performed by LW, they were rare in LY's displays. Whereas stem displays were performed by Güttinger's birds and three of the four offspring hatched in my bird room, I could never induce LW or LY to use stems in their displays. Moreover, displaying with bill wide open and tongue wagging were observed only in two birds (LW and RB).

Individual variation of this degree is not unusual among the Lonchurae. In the Cherry Finch (*Aidemosyne modesta*), for example, males also have a stem display, followed by singing with bill wide open. However, Selmann (1965) informs us that: "... there is great individual variation in this species. Some males never use a piece of grass, others never sing with bill wide open. . . ."

Copulation has not hitherto been described for the Grey-headed Silverbill. It has been suggested that for the Grey-headed Silverbill and other forms of *Spermestes*, copulation takes place normally inside the nest

(Güttinger 1970, Kunkel 1965). Kunkel (1965 : 175) observed only one copulation for *Spermestes (Lonchura) bicolor*. However, Morris (1957) was of the opinion that with the Bronze Mannikin (*Spermestes [Lonchura] cucullata*) copulation on a branch was the usual method, suggesting that he must have observed this more than once. It may not be too unusual then for the Grey-headed Silverbill to occasionally copulate on a branch in the usual estrildid manner. Indeed, several aviculturists (summarized in Immelmann *et al.* 1972, in press) have also observed tail quivering by female Grey-headed Silverbills in response to the courtship dance of the male. An alternative interpretation of these observations would be that this is an artifact of captivity (see Immelmann *et al.*, *loc. cit.*), that awaits verification by field study. It is noteworthy that the bill open, head up posture of one of my soliciting female Grey-headed Silverbills was also observed in Bronze Mannikins by Morris (1957). Females of the latter species, however, also protrude their tongue when soliciting. Morris (*loc. cit.*) considered these to be important components of the female's display, derived from the nest building elements of "mandibulating and scooping".

Derivation of Display Components. The submissive courtship display of the Grey-headed Silverbill is very likely derived from the begging display of the juvenile. The posture of the head (Figs. 1 and 2), the waving tongue and wide open bill are all found in the begging juvenile which does not always twist its head in the more usual estrildid manner (Personal observation). Güttinger (1970) reported that young Grey-headed Silverbills also quiver their wings when begging. Wing quivering is rare in estrildid finches, and has been described in *Aeginthia temporalis*, *Erythrura prasina* (Güttinger 1970, Immelmann 1965) and *Lagonosticta rubricata* (Goodwin, 1964). Friedmann (1960 : 25) reported that nestlings of *Estrilda subflava* "move one or sometimes both wings forward in a jerking, spasmodic gesture". My observations indicate that in begging juveniles of Grey-headed Silverbills the wing distal from the parent bird with food is also often slightly extended. The flicking distal wing in the submissive courtship display of the Grey-headed Silverbill is probably an intention movement to extend and quiver that wing. This opinion was held by Goodwin (1965) who made similar observations on species of *Uraeginthus*. I have reported on one observation of a Grey-headed Silverbill quivering a wing during courtship.

Relationship to Spermestes. LW's completed display was similar in many respects to that of the Bronze Mannikin as described by Morris (1957). The Bronze Mannikin also begins its courtship dance with a crouched display, with the bill open, and the tongue protruding and moving. This is followed by an inverted curtsy display, and later pivoting when performed at higher intensity. Morris' birds also dance toward and away from the female, and leap-frogging was described. The similar postures of the soliciting females of the two species have been

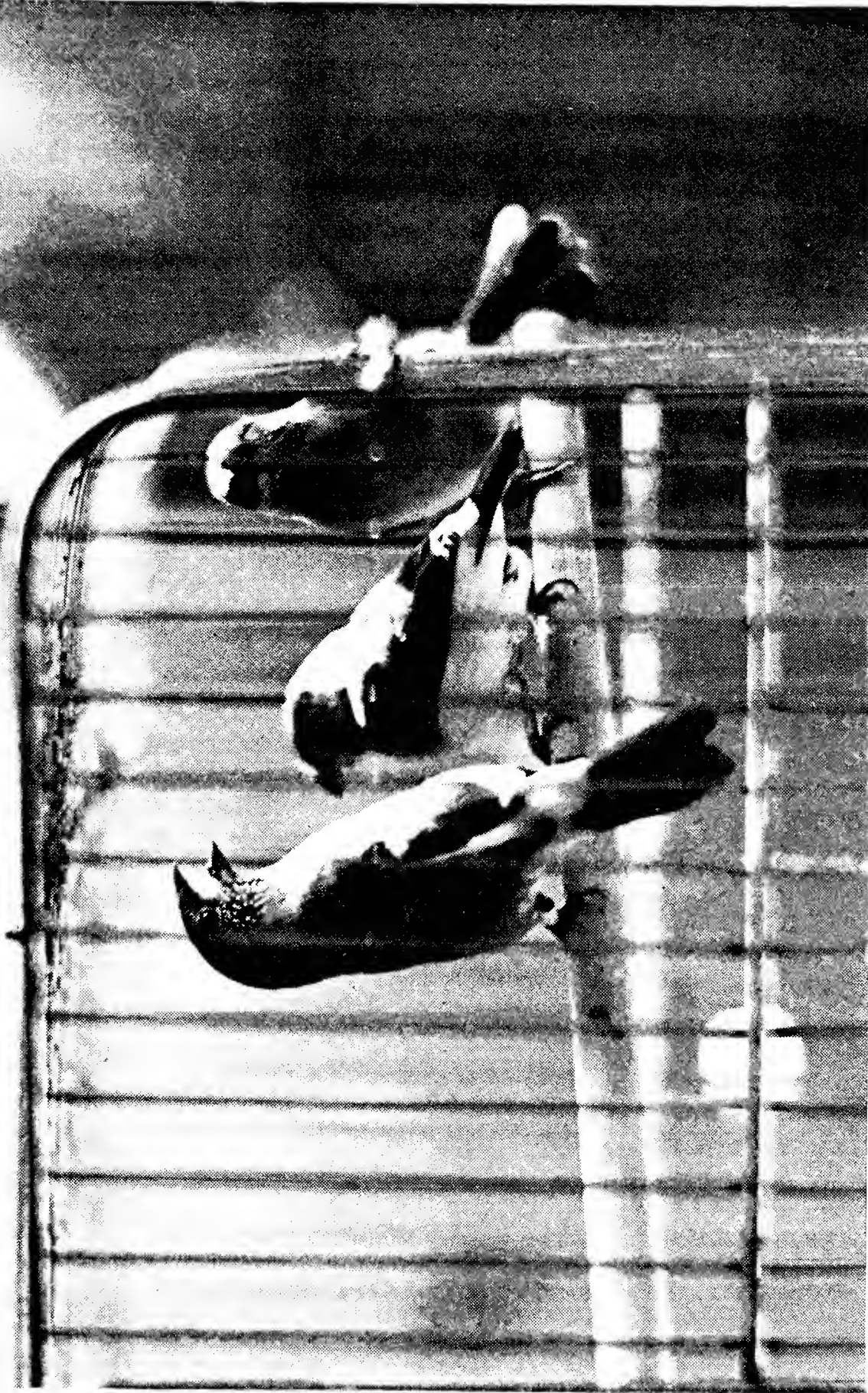


FIG. 2

Photo.: Thomas

High intensity inverted curtsy display. Note the wide open bill and the protruding tongue. This bird is displaying to a stranger (extreme right) introduced into its cage. Note also that its body is bent away from the bird displayed at. The fluffed belly cannot be seen in this picture because the bird has its back turned slightly towards the camera.

THEORY OF THE EARTH AND ITS HISTORY

discussed. The differences between LW's displays and those of the Bronze Mannikin are that (i) LW's bill was pointed up whereas that of the Bronze Mannikin was pointed down. (ii) Wing flicks were absent from the display of the Bronze Mannikin. (iii) The tongue was moved more rapidly (quivered) in the Bronze Mannikin. (iv) Soliciting female Bronze Mannikins protruded their tongues.

Subsequent to Morris' (1957) study of the Bronze Mannikin, Kunkel (1959, 1965) and Güttinger (1970) have studied and compared courtship displays of all the forms of *Spermestes*. The last two authors both concluded that courtship displays of all forms of *Spermestes* are similar, but with quantitative differences with regard to the frequency of occurrence of the display components.

The Grey-headed Silverbill has been placed by some authors in the genus (or subgenus) *Euodice* along with the two Silverbills *Euodice* (*Lonchura*) *malabarica* and *E. (L.) cantans* (see review in Güttinger, 1970). Güttinger (1970; and personal observations) has shown that in a number of behavioural characters (vocalizations, fighting postures, copulation in the nest, absence of peering behaviour) the Grey-headed Silverbill more closely resembles the African mannikins of the genus (or subgenus) *Spermestes*. My observations on the epigamic displays of LW and RB indicate that the courtship displays of the Grey-headed Silverbill, although variable, fall within the range of variation of that of species of *Spermestes*, lending support to Güttinger's conclusion of their close relationship.

The use of the vernacular "Grey-headed Silverbill" for *Odontospiza* (*Lonchura*) *caniceps* would seem misleading, therefore, because it implies close relationship to the Silverbills (*Euodice*). I propose the name "Pearl-headed Mannikin" for this distinctive estrildid, a name similar to the German "Perlhalsamadine".

ACKNOWLEDGMENTS

I thank Drs. Klaus Immelmann, Ned K. Johnson, and my wife, Joyce, for their comments on the manuscript, and Mr. and Mrs. John A. Thomas for all the patience and effort in photographing my birds.

REFERENCES

- RIEDMANN, H. 1960. The Parasitic Weaverbirds. *U.S. Natl. Mus. Bull.* 223.
 WOODWIN, D. 1964. Observations on the Dark Firefinch, with some comparisons with Jameson's Firefinch. *Avicult. Mag.*, 70: 80-105.
 WOODWIN, D. 1965. A comparative study of captive Blue Waxbills (*Estrildidae*). *Ibis* 107: 285-315.
 GÜTTINGER, H. R. 1970. Zur Evolution von Verhaltensweisen und Lautäusserungen bei Prachtfinken (*Estrildidae*). *Z. Tierpsychol.*, 27: 1011-1075.
 IMMELMANN, K. 1965. Australian Finches in Bush and Aviary. Angus and Robertson Ltd., Sydney, New South Wales.
 IMMELMANN, K., STEINBACHER, J., and WOLTERS, H. E. 1972. In Vögel in Käfig und Voliere, pp. 431-440. Aachen. *In press*.
 KUNKEL, P. 1959. Zum Verhalten einiger Prachtfinken (*Estrildinae*). *Z. Tierpsychol.*, 16: 302-350.

- KUNKEL, P. 1965. Verhaltensstudien an den kontinentalafrikanischen Elsterchen (*Spermestes Swainson*). *Vogelwarte*, 86: 161-178.
- MORRIS, D. 1957. The reproductive behaviour of the Bronze Mannikin *Lonchura cucullata*. *Behaviour*, 11: 156-201.
- MORRIS, D. 1958. The comparative ethology of Grassfinches (*Erythrurae*) and Mannikins (*Amadinae*). *Proc. Zool. Soc. Lond.*, 131: 389-439.
- MOYNIHAN, M., and HALL, M. F. 1954. Hostile, sexual and other social behaviour patterns of the Spice Finch (*Lonchura punctulata*) in captivity. *Behaviour*, 7: 33-76.

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ALBINO INDIAN RINGNECKED PARAKEETS

By RAE ANDERSON (Sierra Madre, California, U.S.A.)

Twenty years ago with the help of Dave West I got started with lutino Indian ring-necked parakeets (*Psittacula krameri manillensis*). Then again with Dave's help I started with the blue variety. Since then I have been working the hard, slow way from the original birds with split (recessive) factors towards birds that could produce the albino. The anticipation was like that of a child waiting for Christmas with packages beckoning under the tree.

A few years ago I was successful in getting a lutino cock and blue hen to accept each other. This in itself was a project requiring several years. Then finally one baby was hatched, a green male split to both yellow and blue. Then a yellow hen split to blue and two more cocks, and a year later another hen. This year they hatched a single cock which died within a few days after hatching. I swapped two of these young "split both-way" cock birds with Dave West and John Furniss to reduce inbreeding.

This season a two-year-old pair started work particularly early with a clutch of three eggs in early January, 1972. On 12th February, these eggs appeared to be clear and were removed. The nest was then checked on 24th March, some two or three weeks after the hen seemed to be incubating again. At this time there were four eggs. On 1st April the nest was again inspected and to my exaltation and amazement, there were three pink-eyed babies. These appeared to be about five days old. This breeding combination can produce green, yellow, blue and albino but the probability of an albino is I believe about 1 in 8. The three pink-eyed babies immediately ruled out all greens and blues in this clutch and brought the albino possibility down to about 1 in 3. With three pink-eyed babies this means an almost certainty of having one albino.

Of course, my anticipation was almost without bounds but I did not want to take the nest box down and open it unless the hen was out. For the past two weeks if she was not already in the box she had made a dive for it whenever she saw any of us approaching her aviary. I felt that by this weekend, 22nd April, the babies would be old enough so that they

pin feathers would be opening and would be too large to be injured by the hen's scrambling if I opened the box with her inside.

Upon opening the box in the somewhat subdued light of the aviary shelter with one of my sons, and while we were looking for the possible white baby, my immediate reaction was one of disappointment at seeing only two babies. This disappointment was very short lived, however, as my son recognized before I did that one of the babies was indeed an albino and that it was the larger of the two. The third baby appeared to have been dead about a week. It was decomposed beyond recognition except that a few tiny yellow feathers were apparent. The fourth baby was never found.

I feel very fortunate that the bad odour of the dead baby had not caused the mother to abandon the clutch. We had, however, been checking at least every morning and evening to be sure that she was in the nest. I removed the albino from the nest for hand raising because of Harold Rudkin's experience of the hen killing her white baby. This was probably due to its "odd" colour. I could not risk this because my breeding combination was identical to Rud's.

It is my understanding that the albino raised by the Keston Foreign Bird Farm in 1963 (the first recorded albino Indian Ringneck) was a female. From the colour genetics of its parents (Cummings, 1964) the only albino possibility from this breeding is a hen. This bird unfortunately died before reaching maturity.

Harold Rudkin then hatched the one that, shortly after its pin feathers opened, was killed by its parents. Post-mortem examination proved this baby to be a cock. Its skin is now in the collection of the Los Angeles County Natural History Museum. Then in 1968, Mr. Rudkin was again successful in producing an albino. This time, however, from parents with a different colour genetic combination which could only produce albino hens. This breeding is related in the *American Aviculture Bulletin*, October, 1970. In 1969 Dr. Swaenepoel in Belgium successfully raised one. As stated (Swaenepoel, 1970) this bird had to be a hen. I understand that it is now in the collection of Alfredo Marques. My baby, however, has a 50-50 chance of being a cock based on the colour genetics of its parents. This is from the same breeding combination as Mr. Rudkin's first which was a cock.

At this time the bird is a full grown perfectly proportioned specimen, having been independent since June, 1972. I am not able to do more than guess at its sex because I have neither observed it to display nor other known males to display to it. I am, of course, hoping for a cock.

I am still uncertain as to whether or not the pink neck ring will appear if it is a cock. While I hope that the pink ring will be there, I do not believe that this will be the case. The pink ring might well occur with natural accidental albinism, but I do not think we will see it with "albinos" developed from yellow-blue breedings. In our aviary

developed "albinos" the bird is actually a pink eyed blue (dilute—having lost the melanin) bird. Since it is basically a blue bird with pink eyes and since blue cocks have white neck rings, I suspect that our "albino" factor will produce white birds with white neck rings. I am most anxious for this to be proven one way or the other.

This year, 1973, another albino Indian Ringneck has been produced in California. This was in the aviaries of another aviculturist. This bird is now independent and an excellent specimen. It is from the same genetic combination of parents as is mine. This now brings to three the number of living albinos in Southern California. We believe that this is the total number existing in the United States.

REFERENCES

- CUMMINGS, W. D. 1964. Breeding results at Keston Foreign Bird Farm, 1963. *Avicult. Mag.*, 70: 56-58.
 SWAENPOEL, L. A. 1970. Indian Ringnecked Parrakeets. *Avicult. Mag.*, 76: 92-94.

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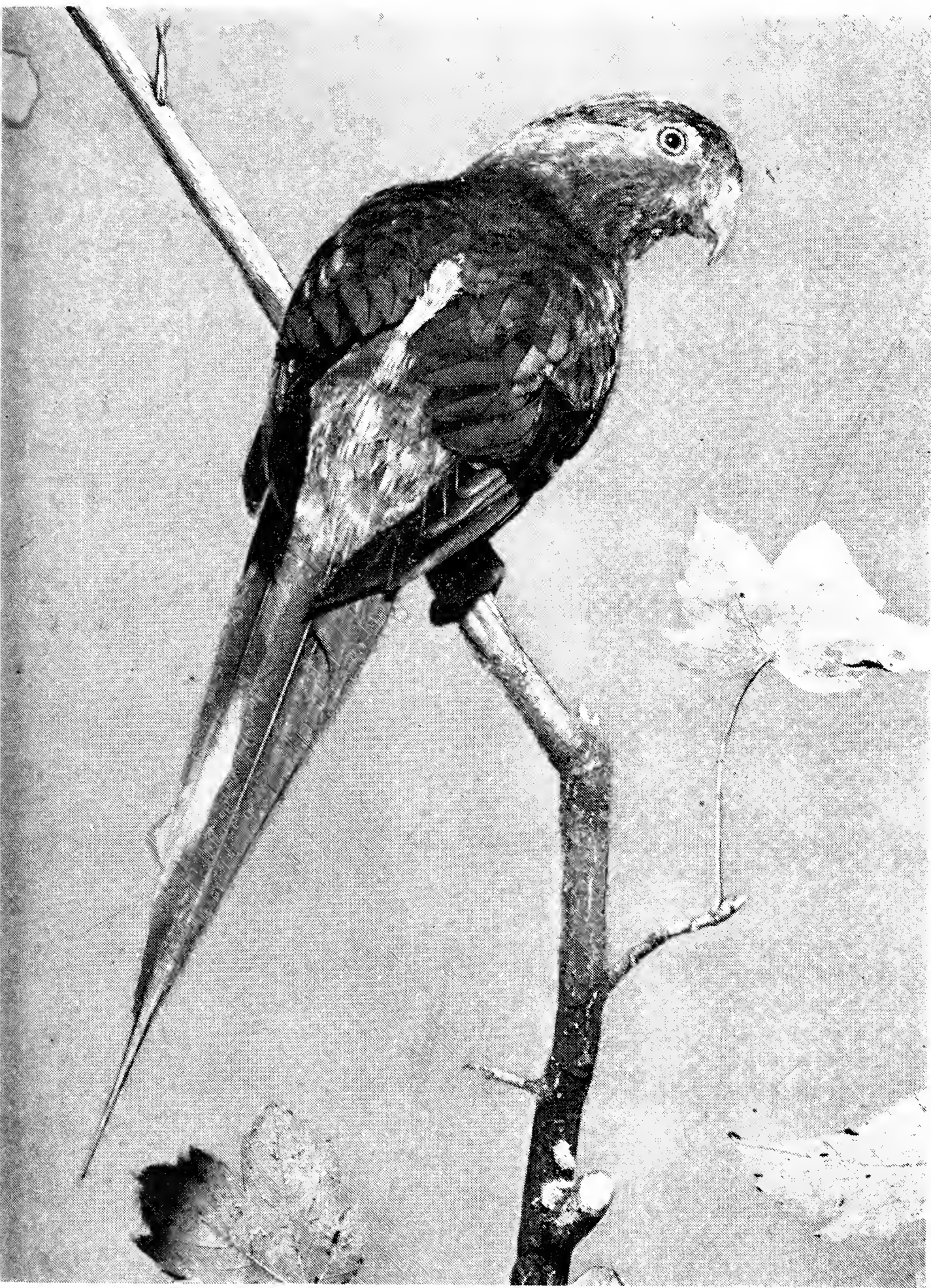
THE PAPUAN LORIKEET

By ROSEMARY LOW (New Barnet, Herts., England)

The Papuan Lorikeet (*Charmosyna papou papou*) is virtually unknown in aviculture and almost nothing seems to have been recorded about it. There is, however, a plate of this species in Mivart's *Monograph of the Loridae*. I never anticipated seeing any of the members of this genus alive, let alone having the opportunity to keep one—but in aviculture unexpected events are always happening, particularly regarding the availability of species.

When a friend telephoned me in September 1972 to tell me that she was about to import a Stella's Lorikeet (*C. p. stellae*) I was at first incredulous and, a few days later, on seeing the bird, completely captivated. The *Charmosyna* Lorikeets are among the most beautiful birds in the world and this individual was hand-reared and completely fearless, thus adding to its attraction. When I was asked if I would like to look after it for a time, my reply was naturally in the affirmative!

On closely examining the Lorikeet, I realized that it was not Stella's; its description agreed with that for the Papuan given by Salvadori in his *Catalogue of Birds in the British Museum*—except for one point. Salvadori gave the length as "from 16.9 to 14.93 inches, tail from 10.6 to 8.23"—yet this bird measured only 11 inches or 12 inches. The mystery was solved when the Papuan moulted its tail (which as the photograph shows was rather frayed); this was replaced by an 8 inch tail to give a total length of approximately 14 inches. The tail is reminiscent of that of a Fischer's Whydah (*Vidua fischeri*) in that it tapers almost to a hair's width. When the tail feathers are spread the beauty of each feather can be seen. There



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[R. H. Grantham

Papuan Lorikeet (before tail was fully grown)

THEORY OF THE THERMAL EXPANSION

is a red patch on one side of the web, also a yellow patch which extends to the side of the web which is mainly green.

This species is extremely slim in build and cannot be compared in this respect with any of the more familiar species of Lorikeet. The shape of the head and beak are, to me, reminiscent of certain Hanging Parrots (*Loriculus*).

The colouring of the Papuan Lorikeet is particularly attractive. The wings and the upper side of the tail are dark green, the underside of the tail and the tip of the upper side being yellow. The head and underparts are scarlet with a darker sheen on the upper breast. There is an almost square patch of colour on the crown, which is dark blue at the front, becoming black. Further back, on the nape, there is a crescent-shaped black patch. There is also a black patch on the abdomen which meets the black of the front of the thighs, the thighs being yellow at the back. The lower rump is decorated with a patch of dark blue.

The feet are pinkish and the nails black; beak orange; iris orange with a very narrow ring of paler orange which is noticeable only on close inspection.

The *Charmosyna* Lorikeets are sexually dimorphic, thus I know that the bird in my temporary possession was a male. Salvadori described the female as follows: "The red feathers on the sides of the rump have the base yellow; a yellow-orange patch over the yellow spot above the thighs."

He stated that in immature birds the nape, abdomen and thighs (which are black in adult birds) are dark green.

Being hand-reared, the Papuan loves attention and would display as soon as I spoke to it. In display, the yellow patches on the thighs stand away from the body. A soft whistling noise is made and one foot is lifted and waved, more rarely both feet in turn.

The flight is unlike that of the more familiar Lorikeets, no doubt partly due to the fact that the long tail holds the bird back to a certain degree. Another characteristic is the way in which a perfectly straight line of flight was never taken, the bird always flying upwards just before landing.

The Papuan refused fruit and small seeds. Its diet consisted of nectar made from equal amounts of honey and malt, with the occasional addition of condensed milk, with the same mixture added to trifle sponge. The Papuan was particularly fond of the latter. Every day several drops of the orange-flavoured multi-vitamin preparation Vitavel were added to the sponge cake and nectar. On this somewhat monotonous diet the Papuan thrived—in fact I have seldom seen a fitter and more active bird. It bathed every day and kept itself in immaculate condition.

After nine months in my care, the Papuan was sold to a fellow member of the Avicultural Society. I am pleased to record that it now resides in a 20 ft. planted aviary, in a collection of small softbills, where it is greatly admired by all who see it.

BREEDING BEHAVIOUR OF CAPTIVE STRIPED OWLS

(*Rhinoptynx clamator*)

By ANN E. GOODMAN and ERMA J. FISK (Florida, U.S.A.)

Two Striped Owls, (*Rhinoptynx clamator*), obtained separately as non-flying juveniles in Iquitos, Peru, have been observed since 17th August 1963 (male) and 14th September 1964 (female) by A. E. Goodman in an outdoor aviary in South Miami, Florida, U.S. This pair has raised five young since April 1969. As nothing seems known of the breeding habits of this owl except that it is a ground nester (Haverschmidt, F., *Birds of Surinam* 1968) we present here a description of the nesting behaviour of this captive pair.

Cage and Feeding

The birds live in an outdoor aviary 6 ft. × 10 ft. × 10 ft. with a natural ground floor, natural perches, and tropical planting. Each bird daily consumes two or three day-old chickens from a supply kept continually available, with an occasional dead rat or mouse as offered. The male has been seen to catch and eat a Cuban tree frog (*Hyla septentrionalis*). Cardinals, Mockingbirds and warblers enter the aviary without molestation. Neither owl has been observed to drink.

Nesting and Incubation

Breeding behaviour was first initiated by the male in February 1966. His soft night hooting became louder, with an aggressive tone. He made rudimentary nest scrapes, proffered food to the female, which she refused, and attempted copulation. This behaviour continued intermittently until the first egg was laid on 6th April 1969. Since then 10 clutches have been incubated, three with four eggs each, seven with three.

The male makes several shallow scrapes at each nesting. Originally these were primitive, but they have developed until the last was a depression about seven inches in diameter, deepened by the female during brooding to three quarters of an inch. The only nesting material is litter such as bits of leaves which the female may pull in while sitting, and stuff under her breast.

Eggs are unspotted pinkish-buff. The only one measured was 4.7 mm. × 5.5 mm. Apparently they are laid before mid-morning at approximately 60 hour intervals. Incubation is by the female only and starts with the first egg. The period to hatching is approximately 33 days. The time differential in four clutches where two chicks were hatched was judged to be from one to five days. During her first incubation the female often left the nest for periods of time, even in rain. Thereafter during

he first two weeks of each brooding she left very briefly, only once or twice a day, to defecate. She is fed on demand, by the male. Eggs are turned with the bill. The nests have been moved several times from one to five feet, either with eggs, or chicks in them. In one instance the chick was three weeks old. The method was not observed, nor the method by which the nest is always kept clean. The female has been observed eating the hatchling's shell. A downpour flooded the nest 11 days before one successful hatching until for 15 minutes only the incubating bird's head was above water. Weather of this sort would be typical in the range of this tropical species.

Clutch

Only one chick is raised. A second chick may hatch, appear healthy, but disappear within a week. The other eggs of the clutch are kicked out during incubation and shortly disappear. In three clutches where one chick hatched one survived, two disappeared within five days each.

Table of clutch dates, number of eggs, and success

Clutch	First egg	Eggs	Chicks	Pipping	Chick seen	Survival
1	4/6/69	4	2	5/9	5/12* 5/15	1
2	12/15/69	4	2	—	1/18/70* 1/21/70	1
3	3/5/70	3	1	—	4/7/70*	0
4	8/10/70	4	1	—	9/15/70	0
—	10/9/70	1	—	Broken	10/10	0
5	11/20/70 11/30/70 12/4/70	1 1 3	neglected neglected 2	—	1/4/71 1/9/71	1
6	5/29/70	3	0		—	0
7	11/23 or 11/24 }	3	2	12/26 —	12/26 12/27	1
8	3/12/72	3	—	deserted a week before term		0
9	5/22/72	3	—	sat full term, then on and off a week, then kicked out eggs		0
10	10/18/72	3	1	11/18/72*		1

* Could have hatched earlier.

the above table the sequence of figures follows the usual custom in the U.S.A., i.e. month, day, year.

Brooding

A chick is closely brooded in the nest for about two weeks. To accommodate its rapid growth the female deepens the nest and broods with arched wings. She maintains this posture, wings arched, head bent over the young, while feeding for some time after the chick has emerged from the nest. Small pieces of food are gathered into a mouthful and proffered with a special cluck, the chick taking the food from her bill. If alarmed she signals the chick to return under her wing by rapping it on the crown. The chick signals its desire for shelter by pecking at the joint of her wing and shoulder until the wing is raised. When a chick has grown too large to brood she backs up against it and raises her wings over it. It is sheltered from rain by this means until it is almost full grown.

When first out of the nest the small chick sleeps flat out on the ground, neck extended, feet tucked under. The female shelters it from sun by raised wing, or her shadow cast from a perch above it. Even when full-grown a chick will lean against the female when resting; and the female was seen to leave a new clutch of eggs untended several times to feed a 50 day old chick that was refusing to accept food from the male. Both parents watch the chick closely at all times. The female stays physically closer, the male is more nervous at human approach to the aviary, and more agitated by the mishaps of flight, or failures in self-feeding of his young.

Bill as a tool

There is some evidence of the bill being used as a tool. Small chicks, unsteady, may fall into the bloody carcasses of the chickens from which their food is coming. The female has been observed to gather pieces of dried leaves in her bill and to use them to wipe the blood from both faces and breasts of the young. With many avian species a chick that falls from the nest, or gets into physical difficulty will be ignored and left to die. One of these young owls attempting flight after clambering up the aviary wire to a high perch, crash-landed in the base of a palm tree and became helplessly wedged among the stiff stalks. Both parents were much agitated. The female flew down and pulled aside one of the stiff stalks until the chick was freed.

Communication

Except when the female is on the nest mating is frequent. The voices of all these owls have been distinctive, and they are strongly communicative. There is much soft, low, conversational hooting by day as well as by night. On the nest the female clucks when she wishes food brought to her and she has been observed to cluck persistently until the male removed unwanted food. If he delays in attending her she becomes agitated and screams. It is the female who shrieks alarm at nocturnal possums or other animals coming about the aviary at night.



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Female Striped Owl on nest, baby with eyes still unopened, apx. 1 week old

[Bob Harner

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COURT OF COMMONS

The first warning sound given by the male when disturbed is similar to the heavy breathing of a human. With continuing disturbance he will click his bill rapidly, hiss and spread his wings. In full attack he is soundless, but hits the aviary wire with great force.

By the 18th day all three birds eat at the nest. The female does not permit the male to feed his young until after she has done so. Later, when she is teaching an older chick to pick its own food, if the male attempts to aid the unskilled young she interposes herself, often screaming, until he retreats. On the other side of the coin, when the eggs of a clutch (that failed) were left unattended, the male was much agitated; and another time, when the female left a nest after heavy rain to spread her wings in the sun, the male screamed at her until, still wet, she returned. Again, a few-day-old chick was seen abandoned out of the nest, extended on the earth, ignored by the female. The male flew hooting about the aviary until finally she scooped the chick up with her bill and tucked it under her. Then he quieted. (The chick disappeared that night.) Chick A, a female, was removed to a second aviary, where she lives with a Spectacled Owl (*Pulsatrix perspicillata*). They copulate and she sits on infertile eggs. But during the mating season she calls constantly to the male of her own species a few feet away. Another chick, removed from its parents at 60 days (as the female was sitting on a new clutch) was also put in with the Spectacled Owl, who preened, and fed it. Both chick and parents cried back and forth to each other for many days.

The following timetables are roughly applicable to the development of all five young, as the growth patterns have been similar.

behaviour development

atching: male at this time only viciously attacks at any approach to aviary.

days: chick seen leaning unsteadily against female, who interposes herself between it and any observer.

days: chick attempts to pick at food.

days: chick sleeps in open close to female; preening effort.

days: chick out from under female for good, except in heavy rain.

days: chick bobs and weaves head like adult, clicks bill, hisses and spreads wings at humans.

days: chick wanders from nest, picking at leaves and sticks.

days: chick perches close to the ground, on sticks or small rocks.

days: chick climbs wire of aviary, using talons, bill and wings.

Unsuccessful attempt at flight.

days: pellet seen cast.

-45 days: chick preens, perches on one foot, like adult. Climbs up wire to high perch, is unable to descend. Stays in this one place for several days, moving away from position to defecate.

- 46 *days*: chick flies short distances, horizontally. Not always with success. Given a first, thorough preening by female.
- 50 *days*: female and chick play together often, nibbling bills, preening and picking at each other, chick grabbing adult feathers in its talons. Chick gives a new, clucking call.
- 57 *days*: chick flies freely and feeds alone, although with difficulty.
- 62 *days*: parents refuse to feed. The chick will cry, day and night for several days, a thin high cry like the squeak of a hinge. Chick A went without food until . . .
- 66 *days*: chick picks 2-day-old chicken off ground and eats it. Usually in feeding small pieces are given, but occasionally a thigh and leg have been seen to be swallowed whole. A single instance was observed at 58 days, of a chicken swallowed whole. An adult has never been seen to do this.
- 132 *days*: both adults attack chick in a bloody battle. Chick removed to another aviary.

Plumage development

Natal down buffy, extending to talons.

10 *days*: eyes opening, facial disk developing

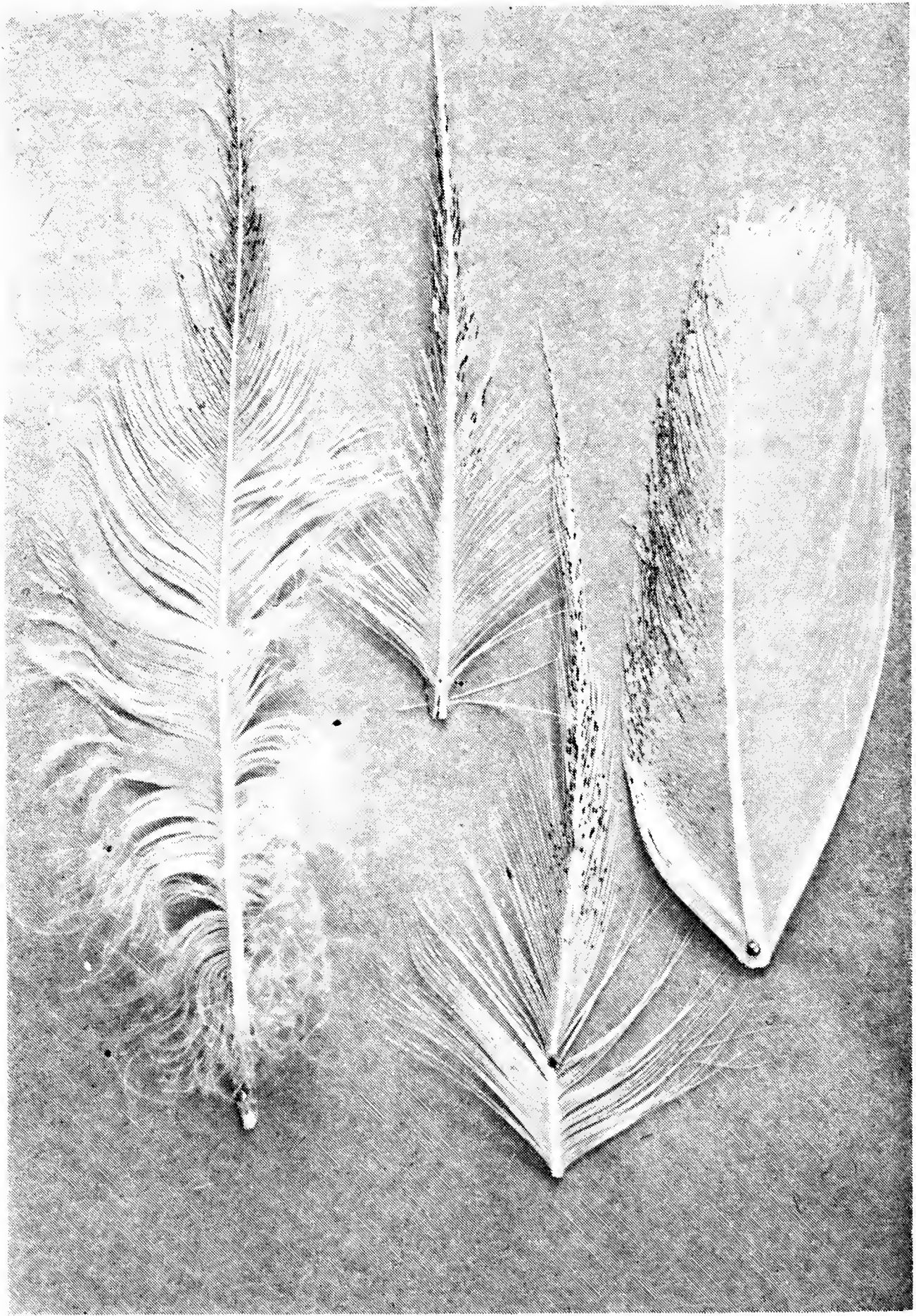
18 *days*: superciliaries faintly pencilled in. Egg tooth still present.

21 *days*: white facial tufts and white of chin showing. Eyes widely circled with a dark brown that remains through juvenal plumage.

40-50 *days*: primaries, secondaries and short barred tail clear of down but body and all coverts still downy gold. Ears begin to show.

51 *days*: horizontal stripes discernible through the still heavy mat of golden down on breast and belly. Long down of flanks obscures the legs. Down largely worn off the mantle, but still present on the erected ear tufts, head, and wing coverts. The juvenal plumage is lighter in colour than the adult, with more buff on the wing feathers. Rectrices are tipped buff. Eyes reddish-brown as against the adult dark brown.

* * *



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[J. V. Beer

Chilean Flamingo feathers which have been damaged by the black hyphal masses of the mould *Cladosporium herbarum*.

FUNGAL INFECTIONS OF THE PLUMAGE IN FLAMINGOS

By J. V. BEER (The Game Conservancy, Fordingbridge, Hants.)
and

JANET KEAR (The Wildfowl Trust, Slimbridge, Gloucester, England)

Cladosporium herbarum, a common fungus present on plants, organic debris and in the air, is also known as a pathogen on the plumage of captive flamingos (Beer 1969). It forms black sclerotia within the feathers, rupturing the cortex and weakening the structure so that the distal portions of the feather barbs break off (see the plate). The plumage of the back becomes dingy and frayed, and the birds are wet and miserable-looking. At Slimbridge, the condition has sometimes seriously affected the Chilean form *Phoenicopterus chilensis* in the late autumn and, to a lesser extent, the Andean *Phoenicoparrus andinus* and James' *P. jamesi* species.

The mould is slow growing at an optimum temperature of 24–25°C. At 27°C, the growth rate is halved and at 30°C, spore germination is completely prevented. Below 24°C and down to 0°C, development is sluggish, although sub-zero temperatures are necessary to prevent growth altogether. At 0°C, a colony on an agar culture will be 2–3 mm. across after 2–3 months. Because of this temperature relationship, only the flamingos' outer feathers, away from the bird's body heat, are affected (the scapulars are especially prone) but, conversely, cold winter weather will not entirely inhibit growth. The spores also survive dehydration and, because they are heavily pigmented, do not succumb to light. Thus treatment is difficult.

Badly affected feathers can be pulled out or cut off. Dusting with a fungicidal powder only affects the hyphae deep in the feather with difficulty. Raising the ambient temperature to 30°C should stop growth, but only while heat is applied; in any case, this temperature level will not kill the mould. At Slimbridge, we have tended merely to wait for the birds to moult.

In the autumn of 1972, the Chilean Flamingos were seen to be particularly badly affected. There had been severe attacks by aphids (greenfly) on three of the willow trees in their pen that summer. The leaf surfaces had become coated with the sugary honey-dew secreted by the insects and later covered with a black mould which had apparently caused the leaves to fall. By December, the tree trunks were still thickly covered with a sooty mould and from this *C. herbarum* was cultured in the laboratory.

Of all the willow species in the Wildfowl Trust grounds, only the species *Salix viminalis* are badly affected by greenfly. These trees have been eliminated. The source of infection in the Andean and James,

Flamingo pen appeared to be a balsam poplar *Populus gileadensis*, the trunk of which has now been painted with malathion.

It is too early to say whether this treatment will prevent mould outbreak on the flamingos' plumage in the future. Clearly, in summers when aphids are especially common, the vegetation in the vicinity of colonies needs periodic examination. *Cladosporium* spores cannot be completely removed from the environment, since they are the commonest fungal component of the airspora, but gross local contaminations can probably be checked.

Apparently *C. herbarum* does not act as a pathogen in other birds, and the captive waterfowl sharing the habitat of the flamingos at Slimbridge are unaffected. The mould is opportunistic and can grow on a weakly nutritive substrate. If the bird washes itself in water contaminated with food and faeces, then the materials adhering to the feather surface provide a substrate on which initial mould growth is possible. This does not explain why the particular fungus invades the structure of flamingo feathers. *C. herbarum* is clearly able to pass through the keratin walls; the action may be mechanical or enzymic. *In vitro*, isolates from infected feathers appear to cause no change in the structure of mammalian hair, although growth is vigorous (Clayton and De Vries, pers. com.). Damage to feathers would be more easily invaded, but only a minute hole is needed. Perhaps keratinisation is less complete in flamingos thus facilitating penetration, and at the same time providing a richer substrate on which the fungus grows and produces the hyphal masses which damage the barbs. Perhaps the preen gland oil is fungistatic in resistant avian species. Further investigation is required.

ACKNOWLEDGMENT

Dr. Collis of the Commonwealth Mycological Institute kindly confirmed the identification of the original isolates and Mr. N. A. Wood cultured and identified the fungal specimens taken from the willows.

REFERENCE

- BEER, J. V. 1969. Isolation of pathogenic fungi from waterfowl. *In* Isolation Methods for Microbiologists, Ed. D. A. Shapton and G. W. Gould. London: Academic Press.

* * *

BREEDING THE MASKED TANAGER

(Tangara nigrocincta)

By C. MILLER, JR. (Baltimore, Maryland, U.S.A.)

In the spring of 1973 I succeeded for the first time in breeding my pair of Masked or Mrs. Wilson's Tanagers. The breeding took place in a flight 8 ft. x 6 ft. x 7 ft. high, located in the third floor unfinished attic of my home in Baltimore. In the flight along with the tanagers were some 8 other birds, all seed-eaters. The tanagers attempted to breed several times before succeeding. Following are the details and background of their breeding history.

I obtained them in November, 1971 from Canary Bird Farm in New Jersey. Walt Frey accurately picked out a pair from a South American shipment for me. I housed them in the above-mentioned flight; the other birds with them were: 1 pr. Java Sparrows, 2 pr. African (Red-billed) Firefinches, 3 pr. Yellow-bellied or Sweet Waxbills, 1 pr. Orange-cheeked Waxbills, 1 Red-eared Waxbill, 1 pr. Starfinches, 2 pr. Cut-throats, 1 Jacarini cock, 1 Red-billed Weaver, 1 pr. Button Quail. The Cut-throats and the Weaver were removed before breeding occurred.

In October, 1972 the Tanagers nested, laid one egg, but did not incubate. They nested a second time 17th December 1972, laying two eggs in a wicker finch nest using only a little hair and string as lining. The eggs hatched in 14 days. The weather at this time was bitterly cold, and, since my attic is uninsulated, temperature there was chilly. On 8th January the temperature at 7 a.m. was 45°F. It rose to 51 as a high that day. I noticed then that all the birds in the flight increased their consumption of live food (meal worms and fruit flies) considerably. On 9th January it was again 45°F at 7 a.m. On 10th January I fed live food at eight in the evening. I noticed then that the tanagers did not feed this to the young immediately as they had been doing. On checking I found both babies stone cold and dead.

On 20th January I was distressed to see that the hen looked a little puffy. I kept an eye on her, and noticed that two days later she was missing. A check revealed a tail sticking out of the wicker nest, which incidentally they had defended as theirs all along. With a mirror I looked into the nest and found two light blue, speckled eggs. One of these hatched on 1st February the other failed to hatch. The young was found dead on the floor of the flight on the evening of 7th February. Thus ended round 2. I should add that this time around I fed plenty of live food in the form of mealworms, corn grubs, and small crickets.

The next round began with a first egg on 18th February 1973. Needless to say, my enthusiasm had died down a bit by now. A second egg was laid on the 19th, and both of these hatched on time on 4th and 5th March. Although the parents were feeding, I removed the young on 6th March

and gave them to Fred Beall, principal keeper at the Baltimore Zoo for hand feeding. Both lived until 10th March. They had been fed soaked dog chow along with flakes of apple and orange.

The next round commenced with the hatching of one out of two eggs on 4th April. Although I fully expected this young one to be thrown out of the nest also, the parents continued to feed it. On 14th April I noticed that its eyes were open, and on 18th April it fledged. On 22nd April I banded the fledgling with the number AS-73-H289.

On 23rd April the hen laid another egg (she had looked puffy on the 21st; apparently this is a sign that she is manufacturing an egg). A second egg appeared on the 24th. On 4th May the fledgling tanager, at four weeks of age, was still being fed by its father. On 7th May I saw it feed itself for the first time, though later in the evening (and subsequently as late as 12th May) I saw the cock bird feeding it also.

On 8th May the firstborn of nest no. six hatched, the other egg again failing to hatch. On 13th May at 8.30 a.m. I found this chick dead on the cage floor. I think it was thrown out, or at least died, because of insufficient live food this time around.

On 20th May the six-week-old fledgling tanager began chasing the tin waxbills for sport, so I caught him up and removed him from the aviary. On fledging, the bird's colour was overall a charcoal grey suffused with blue. The belly was paler grey. The beak was black with gape marked of ivory. At the time of writing it has developed its blue shoulder patch and is fast developing its white abdomen and coppery nape. On fledging its tail was very short, but it could fly well enough to keep off the floor.

The food available to its parents during the time it was in the nest was as follows: apple, orange, banana (occasionally), peanut butter, Prunus insectile (mockingbird) mix, Purina dog chow soaked 30 min. in cold water, finch mix, Scarlett's "wild seed" mixture, Stimulite nectar formula, and live food, including a fruit fly culture.

Some observations on the breeding behaviour of these birds: First, the female does all the incubation. Second, for the initial 14 days, the parents feed only live food to the young. Third, like most monogamous birds, the male assumes most of the responsibility for feeding the young after fledging, while the female goes back to nest. It is interesting to note that these birds are supposed to build an open cup nest in nature, but I chose a covered wicker finch nest in my aviary. Finally, I might add that the *Calliste* tanagers are not quite the "hothouse flowers" that most writers state they are. Mine took a low temperature of 34 degrees throughout the winter, with no ill effects. Success with the Masked has spurred me to try breeding other species of the group; I have a true pair of Speckled Tanagers (*T. chrysophrys*) which were observed mating by me and Mr. A. G. Scott of Toledo, in March. Perhaps they will be next!

As verification of the authenticity of the Masked's breeding, I have had Shon Ross of Baltimore observe the parents feeding the young before

fledgling. Fred Beall also witnessed this. Hal Bruce witnessed the fledgling being fed by its father two weeks after leaving nest and still in juvenal plumage.

* * *

BREEDING THE ORTOLAN BUNTING

(*Emberiza hortulana*)

By JOHN F. DOWLING (Haddenham, Buckinghamshire, England)

During the winter of 1971-2 I received from a member of ASPEBA living in Spain a pair of Ortolan Bunting, *Emberiza hortulana*, which he had hand-reared. The male of this species is brown with dark streaking on back, wings and tail, russet-buff below, with an olive-green head and upper breast, and yellow on throat, moustache-streak and a thin ring around the eye. The female is browner on head and breast and has dark spots on the upper breast. The head feathers form a slight, peak-like crest at times.

Not having kept this species before and wishing to keep them warm I put them in a flight cage, 4 ft. 6 in. \times 1 ft. 3 in. \times 1 ft. 6 in., in my bird-room during the winter months and in the spring of 1972 put them in an outside flight, partly sheltered, 9 ft. \times 6 ft. \times 6 ft., together with three greenfinches, *Carduelis chloris*. They were given a seed mixture but appeared to eat hardly anything except plain canary seed and maggots. Some softfood was available and they were also given 5-6 mealworms a day, which they ate.

Thinking that they would nest low like a Yellowhammer I made several nest-sites close to the ground among growing hops and a small elderberry bush; while for the Greenfinches I also put in wicker baskets surrounded with a little evergreen foliage fixed about 4 ft. 6 in. up. During that season the hen bunting built a complete nest in one of the finch baskets, and then started a second directly on the ground in the open, ignoring the nesting sites in the hops. As far as I know no eggs were laid.

I saw virtually no courtship behaviour, apart from the fact that the cock occasionally offered live food to the hen, and also offered the dried grass used as nesting material. The cock sang his rather simple song usually in the late evening, continuing at times into the night and early morning. During this season the greenfinches bred successfully in the same aviary, ignored by the buntings.

I wintered the pair outside, and this spring, 1973, they started to carry nest material in late April; but before the hen could begin laying she was scalped and killed by the cock. During the subsequent breeding season, when the Greenfinches nested, the cock bunting tried to feed the young and interfered so much that I had to remove him.

During the autumn of 1972 I had received a second pair of these buntings. The male of this pair was very nervous, less brightly coloured and with a slightly dropped wing. The female was very boldly coloured and quite green on head and breast. I caged them for the winter as I had with the first pair and a few days after they came was surprised to find an egg on the cage floor. It was cracked so I broke it and found it to be fertile. The female did not then lay any more.

In May 1973 I put this pair in a flight 10 ft. \times 4 ft. \times 6 ft. 6 in. high, with access to a raised compartment in a bird-room 6 ft. \times 1 ft. 6 in. \times 2 ft. 6 in. high. The outside flight had plenty of growing honeysuckle and a small yew bush, and again I made some nest-sites at about ground level. I had never heard this second cock sing, nor seen any kind of mating or courtship behaviour, but early in June I noticed a lot of dried grass on the floor of the inside flight, which is wooden and painted glossy white. It looked as though the hen had tried to build a nest in one corner but could not shape it because of the slippery floor.

I was not quite sure what to do but in the end I put three clods of dry earth around one corner of the inside flight leaving enough room behind them for a nest. The site was ignored for several days, but on 24 June the hen started building here and on 25 June it looked finished. One egg was laid in the nest on 27 June and others on the two subsequent days. On 29 June the hen was on the nest. This was the first time I had seen her anywhere near it. When I fed the birds that evening I found a soft-shelled egg on the floor, so I presumed that she was sitting on three.

During the incubation period I saw the hen off the nest only two or three times. She usually sat very tight even when I was moving about and feeding birds. Two young hatched from the eggs on 12 July and the third egg did not hatch. On 15 July one young one was dead. After this date I often found the hen off the nest, but the remaining young one, which was covered with whitish down, always appeared well-fed. During this period I fed the small maggots sold as "squats" and small mealworms $\frac{1}{4}$ to $\frac{1}{2}$ in. long, later putting cut mealworms on softfood. The hen was seen carrying these but I have never seen either parent actually feed the young one, although I have seen the hen on the edge of the nest with live food in her bill.

On 20 July the youngster was seen perched on the edge of the nest. On 23 July it left the nest completely and after this for a week it darted for cover every time I went near the flight. On 30 July I was able to watch it for the first time without it flying for cover. It was pale buff with fine streaking on the face and underside, and buffish-brown with darker streaking on the back. It had a pale buff throat, moustache-streak and eye-ring; showing none of the colour of the adults.

At the time of writing in early September the young one is fully independent and well.

As described above the Ortolan Bunting *Emberiza hortulana* has been bred by J. F. Dowling. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

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RECORDS OF BREEDINGS UNDER CONTROLLED CONDITIONS IN BRITAIN

PART 4

By C. J. O. HARRISON (Berkhamsted, Herts., England)

This part completes the list of passerine birds with honeyeaters to tyrant-flycatchers. Pt. 1, crows to starlings, appeared in vol. 78 (1972): pp. 169-172, pt. 2, weavers and waxbills in 78: 205-209, and pt. 3, finches to buntings, in 79 (1973): 96-100.

HONEYEATERS. (*MELIPHAGIDAE*).

NOISY MINER, *Myzantha melanocephala*. W. E. Suggitt. *A.M.* (4) 3 (1925): 265-267.

ZOSTEROPS. (*ZOSTEROPIDAE*).

NATAL WHITE-EYE, *Zosterops virens*. L. Lovell-Keays. *B.N.* (2) 6 (1915): 197-201.

INDIAN WHITE-EYE, *Zosterops palpebrosa*. W. T. Page. *A.M.* (3) 3 (1911-1912): 114-117.

SUNBIRDS. (*NECTARINIIDAE*).

MALACHITE SUNBIRD, *Nectarinia famosa*. Mrs. K. M. Scamell. *A.M.* 70 (1954): 158-162.

SCARLET-CHESTED SUNBIRD, *Chalcomitra senegalensis*. B. E. Reed. *A.M.* 71 (1965): 107-109.

TROGLODYTES. (*TROGLODYTIDAE*).

TROGLODYTE, *Troglodytes troglodytes*. W. E. Teschmaker, *vide* E. Hopkinson. *A.M.* (4) 12 (1934): 316. (Bred in 1914).

CERTHIAS. (*CERTHIIDAE*).

COMMON TREECREEPER, *Certhia familiaris*. F. Meaden. *A.M.* 74 (1968): 200-202.

SITTAS. (*SITTIDAE*).

COMMON NUTHATCH, *Sitta europaea*. F. Meaden. *A.M.* 76 (1970): 10-11.

LONG-TAILED TITS. (*AEGITHALIDAE*).

LONG-TAILED TIT, *Aegithalos caudatus*. W. Painter. *A.M.* 72 (1966): 147-148.

TITS. (*PARIDAE*).

[GREAT TITS, *Parus major*. M. Amsler. *B.N.* (2) 4 (1913): 240-243. (Adults at semi-liberty)].

BLUE TIT, *Parus caeruleus*. M. Amsler. *A.M.* (5) 6 (1941): 195.

WARBLERS. (*SYLVIIDAE*).

WILLOW WARBLER, *Phylloscopus trochilus*. F. Meaden. *A.M.* 76 (1970): 11-12. (bred 1960).

COMMON WHITETHROAT, *Sylvia communis*. F. Meaden. *A.M.* 76 (1970): 9-10.

BLACKCAP, *Sylvia atricapilla*. W. E. Teschemaker. *A.M.* (3) 1 (1909-1910): 145-151. also. R. Suggitt. *B.N.* 8 (1909): 199-200.

AUSTRALIAN WRENS. (*MALURINAE*).

EASTERN BLUE WREN, *Malurus cyaneus*. R. Phillipps. *A.M.* 8 (1901-1902): 246-249.

FLYCATCHERS. (*MUSCICAPIDAE*).

SPOTTED FLYCATCHER, *Muscicapa striata*. W. E. Teschemaker. *Cage Birds* 16 Jan. 1915: 13. *et seq.*. Presumably the reference on W. T. Page's list *B.N.* (2) 6 (1915): 162.

RUFOUS-BELLIED NILTAVA, *Niltava sundara*. K. A. Norris. *A.M.* 67 (1961): 175-181.

TICKELL'S BLUE FLYCATCHER, *Niltava tickelliae*. Rev. J. R. Lowe. *A.M.* 72 (1966): 115-117.

THRUSHES. (*TURDIDAE*).

AMERICAN ROBIN, *Turdus migratorius*. London Zoo. 1908 *et seq.* *L. Z. Repts.* and *A.M.* (3) 12 (1921): 107.

BROWN THRUSH, *Turdus fuscater*. P. W. Thorniley. *A.M.* (3) 1 (1910): 267-269.

MISTLE THRUSH, *Turdus viscivorus*. T. S. Thomson. *A.M.* 75 (1969): 243-249.

SONG THRUSH, *Turdus philomelos*. W. T. Page. *B.N.* (2) 7 (1916): 20. and A. H. Scott. *A.M.* (5) 6 (1941): 53.

REDWING, *Turdus iliacus*. H. Murray. *A.M.* 66 (1960): 166-167.

FIELDFARE, *Turdus pilaris*. T. S. Thomson. *A.M.* 75 (1969): 243-249.

BLACKBIRD, *Turdus merula*. W. T. Page. *B.N.* (2) 7 (1916): 20. and F. Verey. *A.M.* (4) 12 (1934): 182-184.

GREY-WINGED BLACKBIRD, *Turdus boulboul*. W. T. Page. *A.M.* (2) 7 (1908-9): 334. also London Zoo. 1909. *L. Z. Repts.*

- ING OUSEL, *Turdus torquatus*. V. A. V. Carr. *A.M.* (5) 5 (1940): 165-167, 233-234.
- ICKELL'S THRUSH, *Turdus unicolor*. London Zoo. 1904-1916. *L. Z. Repts.*
- GREY-BACKED THRUSH, *Turdus dissimilis*. London Zoo (J. J. Yealland). *A.M.* 75 (1969): 51
- ACKSON'S THRUSH, *Turdus abyssinicus*. W. R. Partridge. *A.M.* (5) 2 (1937): 279-280.
- OLIVE THRUSH, *Turdus olivaceus*, W. Shore-Baily. *A.M.* (4) 2 (1924): 255-256.
- ERMIT THRUSH, *Catharus guttata*. M. Amsler. *A.M.* (4) 5 (1927): 394-398.
- OLIVE-BACKED THRUSH, *Catharus ustulata*. C. Everitt. *A.M.* 65 (1959): 112-116.
- BYSSINIAN GROUND THRUSH, *Zoothera piaggiae*. Winged World (B. S. Ward). *A.M.* 77 (1971): 168.
- RANGE-HEADED GROUND THRUSH, *Zoothera citrina*. H. Astley. *A.M.* (3) 2 (1910-1911): 368 (orange-headed form bred). London Zoo 1912. *L. Z. Repts.* (white-throated form bred).
- LUE-HEADED ROCK THRUSH, *Monticola cinclorhynchus*. Mrs. K. M. Scamell. *A.M.* 66 (1960): 167-170.
- LUE ROCK THRUSH, *Monticola solitarius*. M. Amsler. *A.M.* (4) 9 (1931): 265-270.
- HITE-CAPPED REDSTART, *Chaimarrornis leucocephalus*. Keston Foreign Bird Farm (W. D. Cummings). *A.M.* 71 (1963): 139-141.
- HEATEAR, *Oenanthe oenanthe*. P. Wayre. *A.M.* 72 (1966): 153-154.
- BYSSINIAN CLIFF-CHAT, *Thamnolaea cinnamomeiventris*. A. Ezra. *A.M.* (5) 2 (1937): 306-307.
- IED BUSH CHAT, *Saxicola caprata*. Mrs. K. M. Scamell. *A.M.* 68 (1962): 162-164.
- TONECHAT, *Saxicola torquata*. W. E. Teschemaker. *B.N.* (2) 1 (1910): 365-368.
- HINCHAT, *Saxicola rubetra*. W. E. Teschemaker. *A.M.* (3) 4 (1912-1913): 24-32.
- OUNTAIN BLUEBIRD, *Sialia currucoides*. A. Ezra. *A.M.* (5) 3 (1938): 220-221.
- ESTERN BLUEBIRD, *Sialia mexicana*. A. Ezra. *A.M.* (5) 2 (1937): 243-244.
- ASTERN BLUEBIRD, *Sialia sialis*. London Zoo. 1860. *L. Z. Rept.* and D. Seth-Smith. *A.M.* (3) 12 (1921): 107.
- ACK REDSTART, *Phoenicurus ochrurus*. W. E. Teschemaker. *A.M.* (3) 3 (1911-1912): 293, 330-335. Also eastern form, *P. o. rufiventris*, Mrs. K. M. Scamell. *A.M.* 73 (1967): 156-158.

- DAURIAN REDSTART, *Phoenicurus aurorea*. Mrs. K. M. Scamell. *A.M.* 66 (1960): 216-218.
- COMMON REDSTART, *Phoenicurus phoenicurus*. W. E. Teschemaker per W. T. Page. *B.N.* (2) 7 (1916): 185. see also C. J. O. Harrison, *A.M.* 77 (1971): 134.
- DYAL BIRD, *Copsychus saularis*. London Zoo. 1873. A. G. Butler, *Foreign birds for cage and aviary* 1 (1906): 146.
- SHAMA, *Copsychus malabaricus*. R. Phillipps. *A.M.* 4 (1897-1898): 138-142.
- WHITE-HEADED ROBIN-CHAT, *Cossypha albicapilla*. A. Ezra. *A.M.* (5) 4 (1939): 304.
- WHITE-BROWED ROBIN-CHAT, *Cossypha niveicapilla*. Birdland (L. Hill) per P. Barclay-Smith. *A.M.* 74 (1968): 25.
- ROBIN, *Erithacus rubecula*. C. Smith. *Zoologist* 27 (1869): 1865.
- RUBYTHROAT, *Calliope calliope*. Mrs. K. M. Scamell. *A.M.* 68 (1962): 155-158.
- INDIAN BLUE CHAT, *Luscinia brunnea*. Mrs. K. M. Scamell. *A.M.* 75 (1969): 265-270.
- NIGHTINGALE, *Luscinia megarhyncha*. H. Hanley. *Proceedings of Zoological Society of London* 1851: 196-197.
- SPROSSER, *Luscinia luscinia*. W. E. Teschemaker. *A.M.* (3) 3 (1911-1912): 330-335.

BABBLERS. (TIMALIIDAE).

- BEARDED REEDLING, *Panurus biarmicus*. L. Lovell-Keays. *A.M.* (3) (1914-1915): 358-364.
- BLACK-CHINNED YUHINA, *Yuhina nigrimentum*. T. Shute, per W. J. Painter. *A.M.* 71 (1965): 84.
- BLACK-HEADED SIBIA, *Heterophasia capistrata*. A. Sheriff. *A.M.* (4) 3 (1925): 185-188.
- BLUE-WINGED SIVA, *Minla cyanouroptera*. D. G. Osborne. *A.M.* 77 (1971): 73-75.
- SILVER-EARED MESIA, *Leiothrix argentauris*. R. Franklin. *A.M.* 78 (1972): 83-84.
- PEKIN ROBIN, *Leiothrix lutea*. R. Farrar. *A.M.* (2) 1 (1902-1903) 407. also W. T. Page. *B.N.* (2) 6 (1915): 269-273.
- CHINESE JAY-THRUSH, *Garrulax chinensis*. H. Kenway. vide A. Silver *A.M.* (4) 12 (1934): 304. also E. Hopkinson, *op. cit.* p. 316.
- MASKED JAY-THRUSH, *Garrulax perspicillatus*. London Zoo (J. Yealland) *A.M.* 71 (1965): 8.
- WHITE-CRESTED JAY-THRUSH, *Garrulax leucolophus*. Mole Hall Wildlife Park. *Int. Zool. Yearbook* 10 (1970): 302. (bred 1968).
- RUFIOUS-BELLIED BABBLER, *Dumetia hyperythra*. R. S. de Q. Quincey *A.M.* 67 (1961): 56-58.

DUNNOCKS. (*PRUNELLIDAE*).

RUFIOUS-BELLIED DUNNOCK, *Prunella strophiata*. W. E. Teschemaker. *A.M.* (2) 7 (1908-1909): 359-362.

COMMON DUNNOCK, *Prunella modularis*. W. E. Teschemaker. *A.M.* (2) 6 (1907-1908): 92-96.

MOCKING-BIRDS. (*MIMIDAE*).

MOCKING-BIRD, *Mimus polyglottus*. R. Farrar. *A.M.* (2) 1 (1902-1903): 407.

CATBIRD, *Dumetorum carolinensis*. R. Farrar. *A.M.* 8 (1901-1902): 226-228.

WAXWINGS. (*BOMBYCILLIDAE*).

WAXWING, *Bombycilla garrulus*. F. Meaden. *A.M.* 70 (1964): 191-195. *A.M.* 76 (1970): 12-15. (Bred 1962).

SHRIKES. (*LANIIDAE*).

GREAT GREY SHRIKE, *Lanius excubitor*. M. D. England. *A.M.* 77 (1971): 1-10. (*L. e. lahtora* bred).

RUFIOUS-BACKED SHRIKE, *Lanius schach*. M. D. England. *A.M.* 77 (1971): 219-223.

RED-BACKED SHRIKE, *Lanius collurio*. A. Günther. *A.M.* (2) 2 (1940): 339-346.

EAFBIRDS. (*IRENIDAE*).

AIRY BLUEBIRD, *Irena puella*. Keston Foreign Bird Farm (W. D. Cummings). *A.M.* 71 (1965): 139-141.

BULBULS. (*PYCNONOTIDAE*).

WHITE-CHEEKED BULBUL, *Pycnonotus leucogenys*. Mrs. Mahon. *B.N.* (2) 1 (1910): 300-301.

RED-WHISKERED BULBUL, *Pycnonotus jocosus*. W. E. Teschemaker. *A.M.* (2) 8 (1909-1910): 208-212.

RED-VENTED BULBUL, *Pycnonotus cafer*. London Zoo. *vide* D. Seth-Smith. *A.M.* (2) 6 (1907-1908):

BLACK BULBUL, *Hypsipetes medagascariensis*. Mrs. K. M. Scamell. *A.M.* 71 (1965): 165-168.

WAGTAILS AND PIPITS. (*MOTACILLIDAE*).

RED/WHITE WAGTAIL, *Motacilla alba*. London Zoo. Yarrell's British Birds. 4th. Edn. 1874. 1: 543. (*M. a. yarrelli* bred). W. E. Teschemaker. *A.M.* (3) 4 (1912-1913): 232-237. (*M. a. alba* bred).

GREY WAGTAIL, *Motacilla cinerea*. Rev. J. R. Lowe. *A.M.* 62 (1956): 216-217.

- YELLOW WAGTAIL, *Motacilla flava*. W. E. Teschemaker. *A.M.* (3) 5 (1913-1914): 81. (*M. f. flavissima* bred).
- MEADOW PIPIT, *Anthus pratensis*. E. B. Hall, *vide* C. Hopkinson. *A.M.* (5) 4 (1939): 64.
- ROCK PIPIT, *Anthus spinoletta*. W. E. Teschemaker. *vide* W. W. T. Page. *B.N.* (2) 3 (1912): 338.
- TREE PIPIT, *Anthus trivialis*. W. Painter, *pers. comm.* and *Occ. Pap. A.S.P.E.B.A.* 1 (1967): 1.

LARKS. (*ALAUDIDAE*).

- WHITE-CHEEKED FINCH-LARK, *Eremopteryx leucotis*. W. Shore Baily. *B.N.* (2) 8 (1917): 133-135.
- BLACK LARK, *Melanocorypha yeltonensis*. R. Phillipps. *A.M.* 5 (1899): 169-176.
- WOODLARK, *Lullula arborea*. T. Kinchington. *Occ. Publs. A.S.P.E.B.A.* 3 (1969): 15-16.
- SKYLARK, *Alauda arvensis*. P. Wayre. *Norfolk Wildlife Park Repts.* 1969, 1970.
- CRESTED LARK, *Galerida cristata*. W. E. Teschemaker. *A.M.* (3) 3 (1911-1912): 273-280.

TYRANT-FLYCATCHERS. (*TYRANNIDAE*).

- KISKADEE FLYCATCHER, *Pitangus sulphuratus*. Chester Zoo (M. F. Coupe). *A.M.* 71 (1965): 145.

* * *

NEWS AND VIEWS

According to the 94th Annual Report of the Royal Zoological Society of South Australia 25 species of Parrots were hatched and raised in the Adelaide Zoo last year. Especially notable among them were 2 Musli Lorikeets, 2 Rock and 3 Hooded Parrakeets and 2 Red-tailed Black 4 Leadbeater's and 2 Slender-billed Cockatoos.

* * *

Unfortunately, the Red Shining Parrakeet hatched earlier this year at the San Diego Zoo has died but, according to Dr. Jim Dolan, the Blue crowned Lories are progressing very well.

* * *

A. V. Marques has succeeded in breeding the Sun Conure. Two perfect youngsters left the nest-box in June and now (September) the parents have another three well-grown chicks. The species has been bred in captivity once before, in Florida, but this is almost undoubtedly the first occasion on which it has been bred in Europe.

The pair of Iris Lorikeets belonging to R. Kyme hatched a chick in July which progressed well until it was about 30 days old when it died. This species has not been raised in Europe but has on several occasions in the San Diego Zoo. Several other breedings with a more successful outcome have occurred in Mr. Kyme's aviaries and this year his birds have produced 4 Stanley and 3 Mealy Rosella, 3 Splendid, 1 Turquoise and 1 Yellow Redrump Parrakeets in addition to 4 Azara Conures. His collection has recently been supplemented by several species of rare Lories and Lorikeets and the aviaries are now inhabited by pairs in perfect condition of such rarities as Duyvenbode's, Dusky and Yellow-treaked Lories and Iris, Meyer's and Fair Lorikeets.

* * *

Mr. J. J. C. Mallinson, Zoological Director of the Jersey Wildlife Preservation Trust, writes: "During the first months of this year up to 1st May we have bred the following birds: 10 Cape Barren Geese, 4 Speckled Mousebirds, 3 Rothschild's Mynahs, 4 Triangular Spotted Pigeons, 2 Canadian Horned Eagle-Owls (hand-reared from a day old), 1 Keas and 1 Palawan Peacock Pheasant. New arrivals include 1 female White Eared Pheasant from East Berlin Zoo, 1 pair Coscoroba Swans and 1 Roul Roul Partridge. We have just completed building a six-unit specially designed Palawan Peacock Pheasant range. The aviaries have a shut off area at the back, and an outside area measuring 12 ft. wide by 20 ft. long, and these are planted with shrubs and have a 4 ft. x 5 ft. pane of glass in the front of each unit. It is hoped to establish a viable breeding group of this endangered species, on the same lines as we have done with our White Eared Pheasant, of which the Trust now owns 2 specimens."

* * *

Although two members of the genus *Charmosyna* were bred successfully just before the First World War by Brook in Scotland, the stock died out and the possibility of ever seeing again specimens of these glorious lorikeets in our aviaries appeared very remote. A few Stella's Lorikeets were imported privately in the 1930's and went to the collection of the late A. Ezra at Foxwarren Park where they flourished but did not breed. Except for these, it is unlikely that any other specimens of the genus appeared in this country for 50 years. It was a big avicultural event, therefore, when a private importer succeeded recently in obtaining a single specimen of the Papuan Lorikeet which is now reported to be arriving in the collection of Raymond Sawyer. Even more exciting was the acquisition by the same enterprising importer of more than 20 Fair Fairy Lorikeets (*C. pulchella*) all of which arrived in excellent condition. This tiny, colourful species, about the length of a Budgerigar

but of considerably smaller body size, is truly what the late Duke of Bedford would have described as an "exquisite psittacine gem". Let us hope that the unique opportunity not only to emulate Brook's success but also to establish an aviary breeding strain will not be wasted.

* * *

When I first joined the Avicultural Society, almost 30 years ago, one of the most regular contributors to the magazine was Dr. Alan Lendon. Almost every species of Australian parrakeet bred successfully in his aviaries, and I remember well his series of articles in the magazine which ultimately were published in book form. More recently he wrote about the Golden-Shouldered Parrakeet, the Cloncurry Parrakeet and the Blue-cheeked Rosella all of which he did much to establish as aviary strains in Australia. He is not only an ardent aviculturist but also a very keen bird watcher and his accounts of birds in the wild, some of which have also appeared in the AVICULTURAL MAGAZINE, have made fascinating reading. For years I have wanted to meet Dr. Lendon but my ambition was fulfilled only recently when I visited Adelaide early this year. The few days which I spent mainly in his company represent a highlight of my avicultural career. Together we visited some of the parrot collections in the vicinity of Adelaide and spent several hours watching the host of species of waterfowl which thrive on the South Australian salt pans. I shall write about the species we saw on another occasion, but the most exciting to me were White-backed Wrens and my first Grass Parrakeets in the wild, a pair of Elegants. Dr. Lendon is still a practising aviculturist but he has reduced the size of his collection considerably and now keeps pairs of rare species like Golden-shouldered Hooded and Orange-bellied Parrakeets as well as Leadbeater's Cockatoo and a breeding colony of African Grey Parrots.

J. R. HODGES.

* * *

Additional Note

It is with great regret that news has been received of the death of Dr. Lendon.—EDITOR.

ANNUAL DINNER

The Annual Dinner was held on 17th September, 1973, at the Clive Hotel, Hampstead, London, N.W.3.

Present: Dr. Jean Delacour (President), Mr. Walter Van den bergh (Director of Antwerp Zoo) and Mme. Van den bergh, Mr. Colin Rawlins (Director of London Zoo) and Mrs. Rawlins, Mrs. Nicole-Duplaix (Hall Editor, International Zoo Yearbook).

Members: D. Ashley, Miss P. Barclay-Smith, Mrs. W. Duggan, J. Everitt, Miss R. Ezra, I. G. Hale, C. J. O. Harrison, R. T. Harvey, Mrs. M. Haynes, L. W. Hill, H. J. Horswell, Dr. J. Kear, Dr. S. B. Kendall, J. T. Kyme, P. J. Olney, Mrs. G. Schomberg, G. Schomberg, Mrs. L. C. Ward, J. R. Wood, J. J. Yealland.

Total attendance: Members—22, Guests—19.

After an excellent dinner, Dr. Delacour presented the President's Medal to Mr. Walter Van den bergh in recognition of his outstanding services to the cause of aviculture.

In making the presentation, Dr. Delacour spoke of his memories of the Antwerp Zoo which he first visited as a boy in the early 1900's and of how the Gardens had suffered in the two world wars. Under the directorship of Mr. Walter Van den bergh, the Gardens and the Collection had been transformed to their present excellence. Dr. Delacour also spoke of the work done by Mr. Van den bergh and his colleagues in the breeding of the Congo Peacock and the reconstitution of the Imperial Pheasant from the single living specimen available to him, the latter species now being almost certainly extinct in its native Indo-China, and of the achievements at Planckendael, the Antwerp Zoo's country estate where many species of birds are bred. It was for Mr. Van den bergh's outstanding contribution to aviculture that he was being presented with the President's Medal, only the fourth to be awarded in the long history of the Society.

In reply, Mr. Van den bergh expressed his deep appreciation on behalf of himself and his colleagues for the honour bestowed on him.

* * *

VISIT TO CHESTER ZOO

Thirty-eight Members of the Society, including the President, Dr. Jean Delacour, visited Chester Zoo on 19th September 1973, at the kind invitation of the Director, Mr. George Mottershead, and the Council of the North of England Zoological Society.

Members assembled at 12.30 for sherry which gave a rare opportunity for southern and northern Members to meet each other. After a delicious luncheon, Mr. Mottershead and Mr. W. Timmis, Curator, took the party on a fascinating tour of the Zoo.

There was so much to admire in the beautifully landscaped and planted gardens, the well-designed buildings which were both functional and attractive, and the many rarities amongst the exhibits, that it would be hard to single out the most enjoyable feature, but probably the magnificent Tropical House held the Members' interest for longest.

The time passed far too quickly and after meeting again for tea at 5.0 p.m., Members with long journeys reluctantly had to leave.

I am sure that all Members would wish to thank Mr. Mottershead and his staff most sincerely for their warm hospitality and for giving the Society such an interesting and enjoyable day.

Hon. Secretary.

* * *

REVIEW

PIGEON RACING. By H. R. AXELROD and E. C. WELTY JR. London
The Oak Tree Press, 1973. Price £2.50.

As a boy I kept and flew Racing Pigeons for my own amusement. During part of the war I was in the Middle East Pigeon Service, an organisation which gave me a great deal of time to watch Racing Pigeons. I have, however, never indulged in the competitive sport of pigeon racing so it must be understood that I am only qualified to review this book as an ornithologist and pigeon-addict, not as one directly involved in the sport in question.

The book starts off with a refreshing lack of false modesty: "Just follow my suggestions . . . compare them with any other advice you have been given. I am sure you will have little trouble in being consistently amongst the top winners". The pigeon racer's love for his birds is emphasised much in the book makes it clear that this love is conditional upon the birds performing as their owner dictates and desires. This being so, it is perhaps as well that the statement (p. 10) that "... the pigeon loves Man . . ." is demonstrably untrue as a generalisation even though it may be valid for a few individual pigeons.

Information on the keeping, breeding, training and flying of Racing Pigeons is given in detail. In spite of this being, as we are assured, based on personal experience, it often reads surprisingly like a compilation. It is, for example, surprising that anyone who has looked closely at, let alone handled, a blue chequer (the commonest colour pattern in Racing Pigeons) can write (p. 83): "A checker occurs when a pigeon's basic colour is covered with small feathers of a darker shade—". Some other statements also seem questionable or at least not applicable to all Racing Pigeons, for example, that "very little attention is paid to the first egg" (p. 56).

The widowhood system is fully explained. The section on this should be of thought-provoking interest for all students of bird behaviour, especially any who doubt whether birds feel emotions as strong, illogical, and easily manipulated by the unscrupulous as our own. The book is very fully illustrated with sketches, diagrams and a large number of excellent photographs. These latter include adult Racing Pigeons of almost every colour pattern, young of varying ages, and a few fancy breeds.

D. G.

* * *

NOTES

TANAGER DISPLAY

Last year I promised a note on the sexual behaviour of a pair of Paradise Tanagers, *Tangara chilensis*. In June 1972 I one day observed the male of a pair appearing from a hawthorn bush with a bamboo-leaf carried crosswise in the bill. He landed on the side of the female with the feathers ruffled, the wings drooped and shivering, and beak and tail pointed upwards. This happened several times during the period of observation. Each time he entered the bush on one side and emerged from the same place on the other side, uttering a "si-si-si-si-si" call in a falling intonation. He reminded me to a high degree of the Cordon Bleu, *Uraeginthus angolensis*. I was unfortunately in hospital a few days later, but on returning a month later I again saw the same behaviour once or twice, before the pair were released by some other inmates.

Once I have seen a male Golden-eared Tanager, *Tangara chrysotis*, crouched on a shelf, raising the ear-coverts in a similar manner to those of the Violet-eared Hummingbird, *Colibri coruscans*, and giving the head a somewhat snake-like appearance. This was the only occasion on which I observed this behaviour.

E. NØRGAARD-OLESEN.

* * *

NOTICE

FIRST BREEDING OF THE SILVER-EARED MESIA

Mesia argentaurea

The breeding of the Silver-eared Mesia by R. Franklin was reported in the Magazine, vol. 78 (1972) : 83-84. We have not found an earlier account of the successful rearing of this species to a point where the young were independent. It seems possible that the above account may represent a first breeding. Any member or reader knowing of a breeding of this species in Great Britain or Northern Ireland prior to the above is requested to communicate at once with the Assistant Editor.

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The nineteen candidates for Membership in the July-August 1973 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

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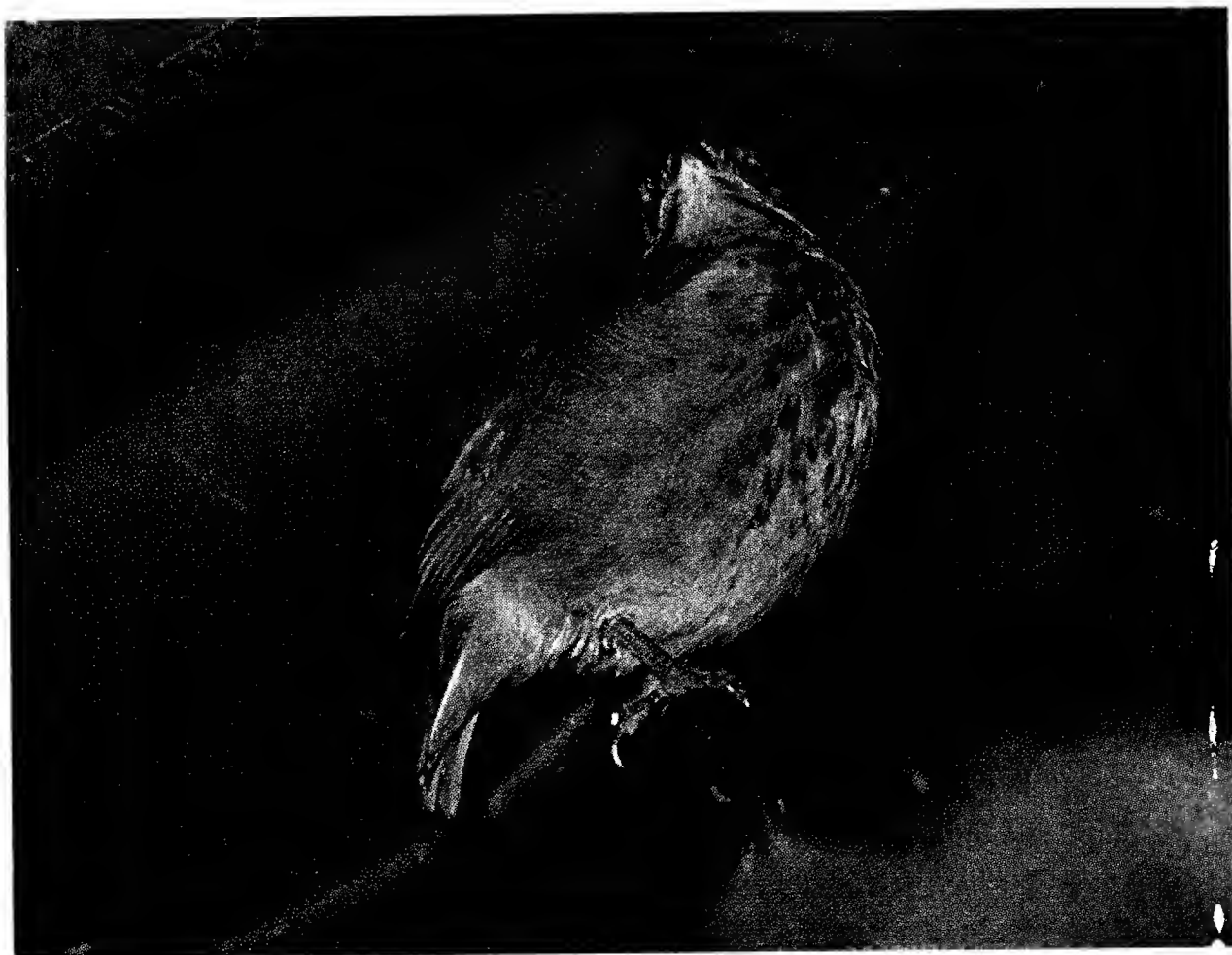
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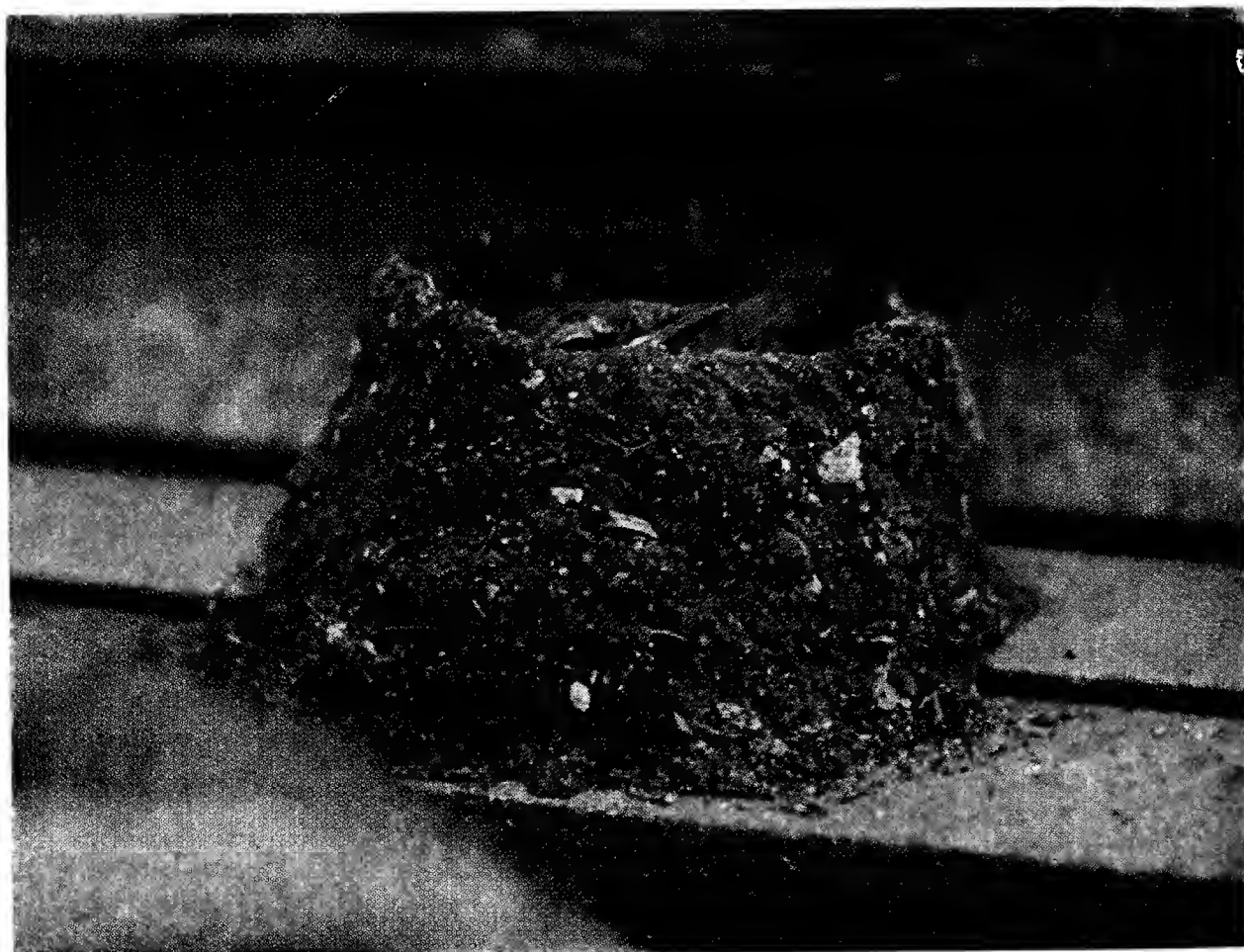
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Spotted Morning Warbler on nest

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NOVEMBER-DECEMBER 1973

BREEDING OF THE SPOTTED MORNING WARBLER, *Cichladusa guttata*, AT BIRDLAND

By L. W. HILL (Bourton-on-the-Water, Glos., England)

Birdland possessed one Spotted Morning Warbler: and in 1971 a second one was purchased, which, after a period of re-adjustment under the care of John Midwinter, who is excellent in these matters, was put into my Tropical House where it very fortunately proved to make a pair. The Tropical House is well-vegetated and maintained at a temperature of about 70 degrees Fahrenheit.

After a few months it was noticed that the birds were trying to make small piles of mud on the Palm Tree leaves. It was hardly believable that this was nest-building, but both birds were very busy at their objective. One day in 1972 a small mud nest was observed on top of a small girder. It was approximately 3½ ins. high and the bird was sitting on it. The nest resembled a minute Flamingo's nest except for the lining of plant material. Eggs were laid and a chick hatched.

Full success was achieved early in 1973. On 23rd April both birds were frantically building a nest on the same small girder. On 26th April the hen was sitting on the nest, probably all day. It was assumed that the first egg had been laid. On 11th May there was a young one in the nest, being fed with mealworms and maggots; and on 24th May it left the nest and was really airborne in the next two days.

Since then the birds have nested several times and single young again been reared.

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As described above, the Spotted Morning Warbler, *Cichladusa guttata* has been bred at Birdland, Bourton-On The Water. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

The cost of the colour blocks illustrating L. W. Hill's article has kindly been given by the author.

THE BREEDING OF THE SPOTTED MORNING WARBLER, *Cichladusa guttata*, AT THE WINGED WORLD

By BRYAN S. WARD (Heysham, Lancs., England)

The Spotted Morning Warbler, sometimes known as the Spotted Morning Thrush, is a small thrush-like bird of six and a half inches. Its upper parts are a dull rufous brown with a creamy-buff eye stripe, while below is also creamy buff, heavily marked with large black spots. The tail is cinnamon. There are three species of Morning Warbler all confined to Africa. The Spotted Morning Warbler is found in the southern parts of the Sudan spreading southwards through Ethiopia, Uganda and Kenya down to central Tanzania.

They are comparatively rare in captivity, possibly due to the fact that they are not one of the more brightly coloured species which a lot of people seem to prefer, although in a quiet sort of a way they are very attractive birds and have an extremely pleasant song. This is usually heard in the early morning and late evening. The sexes are more or less alike, but the cock appears to have larger spots than the hen.

We have kept this species in Winged World for a number of years and have found them extremely easy to cater for; their requirements being a good soft food mixture and live food such as maggots and mealworms. Our original two birds built a number of nests over quite a long period of time. These were made mainly with mud, mixed with the odd piece of dried grass or rootlets and shaped into a deep cup approximately four inches across overall, perfectly rounded, and about three inches deep, the mud being nearly half an inch thick. These were invariably built on the top of a vertical branch with a minimum width of three inches, where the higher portion had been broken off leaving a rough finish.

They laid two pale greenish-blue eggs and incubated for twelve days plus, they then left the nest which ultimately collapsed. As mentioned above, this happened on a number of occasions, it wasn't until we found four eggs in one nest that we realised that we had two hens. We then attempted to obtain two more birds, with the idea that out of four birds we would have a better chance of getting a true pair.

Our two new acquisitions arrived in September 1972 and as one of them was more heavily spotted than the other we thought that we could have a true pair with these birds, and consequently released them both into one of our planted compartments.

Within a month they had started carrying mud up into a rubber tree and were attempting to fix it onto a sloping branch, with hopeless results. We then decided to help by fastening a piece of plastic netting horizontally near to where they were trying to build. They did construct a nest on this, but that too was unsuccessful.

A wicker nest-basket was then fixed up earlier this year close to the plastic mesh and some mud was pressed into the bottom and sides to give them a little encouragement. This they readily accepted and ultimately hid their eggs in, without very much more nest building. They incubated for approximately twelve days. It is impossible to be more accurate, as the necessity of placing the nest in a secure place also made it difficult to obtain good visibility owing to the foliage around it.

The chicks duly hatched, one was found on the floor beneath the nest at an approximate age of two days, the other one leaving the nest fifteen days from the assumed time of hatching. In colouring the young bird resembles its parents, but is considerably smaller. Even so, it was going quite strongly on first leaving the nest on 1st July.

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BREEDING THE SILVER BIRD

(*Empidonis semipartitus*)

By MRS. K. M. SCAMELL (St. Keverne, Cornwall, England)

This very attractive, graceful and unusual Flycatcher is not often imported into this country and I have not seen others than those we have obtained ourselves direct from Roberts Wildlife of Lake Baringo, western Kenya. There are three races, the nominate race from northern Ethiopia where it is stated to be common in dry thorn country, *havirondensis* which ranges from South-east Sudan, Uganda, the western half of Kenya to north Tanzania and the third race *orleansi* which ranges over parts of eastern, central and southern Sudan into western Ethiopia. The nominate race is said to be slightly darker above than the other two races and the wings and tails of *havirondensis* are longer than either of the other two races. We believe that some of the Silver Birds we have imported have been *havirondensis* and possibly two of them *orleansi*. The adults vary in length from a little under 7 ins. to 7½ ins and in colour are a very grey above with the primary feathers dark grey. Below they are a pale tawny. Both sexes are alike.

Our experience has been that Silver Birds are more sociable among themselves than any other flycatchers we have kept. Even in the breeding season we have had three of these adult birds in one aviary and though there was some chasing there was no fighting. They are not to be kept in a mixed aviary with smaller birds. There is no territory song but both sexes have a low and sweet song and call which is most distinctive.

In June 1966 we imported a pair of Silver Birds with their own

youngster which was still in juvenile plumage. We housed them in a planted aviary with a flight 9 ft. \times 6 ft. \times 6 ft. and a shelter 6 ft. \times 6 ft. \times 6 ft. high. Though all three birds appeared to be in excellent condition within a month the hen started to spit and sneeze and quickly died. A postmortem showed respiratory parasites. The cock developed the same symptoms but after a few days in a hospital-cage and with a veterinary surgeon prescribing thiabendazole dusted on its mealworms for a week it seemed to recover, but not for long as it died later that summer. The young bird never developed the parasite and is still in perfect condition now, seven years later. The next problem was to get a mate for our unsexed bird still in juvenile plumage and it was not until May 1969 that we were successful. From the behaviour of the two birds in the aviary we felt sure we had a true pair, the new arrival, being slightly deeper in colour below, broader and a little longer, was a male and our three year old bird a hen. Within a few days the latter started building a nest in an open-fronted nest-box in the shelter. According to the "African Handbook of Birds" Vol. 2 by C. W. Mackworth-Praed and Captain G. H. B. Grant, from which book we have also obtained most of our information on the nesting behaviour, range and races of the species and their natural surroundings which is mostly open acacia bush, the nominate race appears invariably to breed in old weaver nests, usually those of the White-headed Buffalo Weaver *Dinemellia dinemelli*. The other two races either build a large nest of dry grass with a roof of thorny twigs or use the nest of other species particularly those of the larger Weavers.

By the 13th June our 1966 hen had cleared up all the dried grasses and loosely twisted string or cord which we tease out and supply as a nesting material to many of our birds. The nest-box was soon filled to overflowing with an untidy mass of material and bore little resemblance to a nest. On the 22nd June it seemed that she was making no progress so we fixed up another nest-box in the flight—this time with an entrance hole. She quickly switched to this box but was intimidated by a cock Tacazzi Sunbird, one of a pair nesting in the adjacent aviary, and soon returned to her shelter nest-box. We then moved the nest-box from the flight to the shelter to give her the choice of the two but she still preferred the open-fronted one. On 1st July another pair of Silver Birds arrived from Kenya. They were in perfect condition but as I was so sure that we already had a true pair I let a friend of ours have the new arrivals.

Throughout the summer nest building continued but the hen seemed unable to finish it off. It almost filled the nest-box by now, with the entrance high up. The grasses and teased string all seemed to be laid in one direction and not woven in any way. Feathers and other nesting materials were ignored. We were convinced by this time that this particular bird was incapable of building a nest to her satisfaction and was probably descended from a long line of Silver Birds which use discarded Weaver nests so we sent to Kenya for such a nest! When it arrived

placed it inside another open-fronted nest box which it almost filled—but the hen never took a look at it though we watched for hours over many days.

In June 1970 the hen commenced nesting again in the open-fronted box in the shelter after the two birds had wintered together in the same aviary. She spent most of her time in the nest, sometimes remaining in it when I came into the shelter to feed. At intervals I checked the nest but no eggs were laid. She seemed to prefer long lengths of the used-out string or cord and threw out all the short lengths she had used earlier. As last year she remained unsatisfied with the result and so passed another frustrating summer for the birds and ourselves! In September our aviaries were dismantled and in October we moved to Cornwall with the Silver Birds, other softbills and some nectivores. Both birds spent the winter in cages in the bird room at our new home until an aviary was ready for them. Early in the Spring of 1971 the male Silver Bird died. It had been ailing for some time and though separately caged from the hen, it had never really settled down since our move. The 1966 hen was placed in its new aviary with two Ant Thrushes which are ground birds, while we awaited the arrival of two more Silver Birds from Kenya. Though without a mate that summer she nested continuously in an open-fronted nest-box in the flight.

The two new Silver Birds arrived on 31st August 1971 and seemed a little nervous. It was a bit late in the year to try and acclimatise them in the new aviary as the 1966 hen so after a short period in a cage together we transferred them to a small aviary with a heated shelter and let them out in the flight for fine days only for the next eight months. All three birds called to each other frequently.

On 21st April 1972 we transferred the Ant Thrushes to another aviary and replaced them by the two 1971 Silver Birds, shutting the three birds in the shelter each night and releasing them to the flight each morning. The three birds agreed and no fighting took place. Two food pots were supplied always. The flight is 21 ft. long by 6 ft. wide and is 6 ft. 6 ins. high. The shelter measures 6 ft. \times 4 ft. \times 7 ft. 6 ins. high and is a compartment of our birdroom which we keep at a minimum of 45°F in the winter. The open-fronted nest-box of $\frac{1}{2}$ in. wood measures inside 5 ins. wide, 12 ins. deep 4½ ins. high in front and 5½ ins. high at the back, is placed outside the shelter window about 6 ft. from the ground and facing north. It is at the north end of the flight and is under a flat roof which covers the flight for about 4 ft. of its length. This flat roof gives the nest-box cover from rain and direct sunshine. The aviary runs from south to north and is heavily planted. There are two hydrangeas, a 4 ft. high shrub of *Lonicera nitida* about 10 ft. long, two fuchsias, two small blackberries, a eucalyptus tree up to the roof and which requires much pruning, a geranium and a few spirea which are grouped around the nest-box area to give it some privacy. Outside the flight on the west side are three eucalyptus trees about 5 ft. or 6 ft. high and several alder about 10 ft.

to 12 ft. in height. On the north side there is a small wood of deciduous trees which screens the aviaries from a road which is busy in summer and helps to break the cold spring winds we seem to get. All this is ideal cover yet the flight receives ample sunshine from the south and we have. Other nesting-boxes were erected but no interest was shown in them. The old hen again resumed nesting in her old box.

At first it meant shutting the birds in the shelter each night as the spring was cold until the middle of May, particularly at night. As in the past, the 1966 hen had a busy summer, building and rebuilding her nest and sitting in it for days at a time except when she fed. No eggs were laid. The 1971 pair gave her a wide berth but made no attempt to nest themselves. About this time we had started breeding locusts and these became a part of the daily diet. They were readily taken, mostly by the cock. In another summer and winter passed, the three birds in the flight by day from October to March and in the shelter at night.

In March 1973 when it came to the nightly job of shutting the birds in the shelter, the 1971 hen became more and more reluctant to enter so for her own safety we caught her up and caged her and now hoped the old hen and the 1971 cock would pair and breed. On June 1st no progress had been made so we rather sadly came to the conclusion she would have to be removed from the aviary and caged. We replaced her by the 1971 hen. During the next few days there was some wild chasing of the hen by the male—up and down the flight for minutes at a time following which they would perch together. Though we never saw them mate, we did feel they were compatible. The question was, would the hen be capable of completing a nest or would she behave like the 1966 hen? We had it long to wait; on 8th June just eight days after we had transferred her to the aviary, there was a well finished and domed nest in the same nest-box plus one egg! The entrance hole was at the top and the materials were the same, teased out string or cord and some raffia.

The weather was now very hot for this part of Cornwall, about 73°F. Incubation continued normally and when I checked the nest on the 22nd June there were three eggs, one more than is normal in Africa. At 10 a.m. on the 23rd June I saw an eggshell fragment near the water pit about 18 ft. from the nest. This was the 16th day since the first egg was laid and 14 days since incubation had started. From then on we gave mealworms *ad lib.* (instead of about 10 each twice daily, with a similar quantity of maggots plus insectivorous food which they will eat very well if they are rationed with live food). The weather was again very hot, 74°F, with almost unbroken sunshine. The nest-box under the flat roof must have been many degrees hotter so it was not surprising that the hen did not brood as much as one would expect. However we had the consolation of seeing her taking mealworms to the nest several times and saw both birds hawking for insects in and around the bushes. Whenever we have to give mealworms in quantity, which is usually when young birds

re in the nest, we always coat the mealworms with vegetable cooking oil and dust them just as lightly with "Vionate" vitamin/mineral additive. Either must not be done too freely or the mealworms become limp and the birds won't feed them. The next day we saw some livefood being carried to the nest, but in the afternoon both birds were perched together for long periods. It was again hot. Partly from curiosity and partly from our need to know how many chicks we were catering for (mealworms can be in short supply just when you need them and one requires a stock for safety), we shut the parents in the shelter and covered the window with newspapers while we checked the nest. There was one chick and two unhatched eggs which we left.

During the next few days the weather was cooler and more time was spent by the hen brooding. Only mealworms and locusts were fed by both parents, maggots were untouched. On the 1st July we observed the male kill a third instar locust and take it straight to the nest, the hen flying out as he arrived. The male then went in to feed. The door-framing at the end of the flight furthest from the nest was by now plastered with excreta sacs deposited by the male. The hen dropped the sacs she carried into the larger hydrangea. By this time we were supplying about $1\frac{1}{2}$ ozs. of mealworms and about 25 locusts a day. On the 6th July, the 14th day after hatching, both parents were observed for over an hour during the afternoon but were not seen to take food to the nest, so with the parents in the shelter and its window covered, I carefully put my hand in the nest-box and felt a silky, fully-fledged bird which seemed to fill the whole of the nest. Earlier in the day we had seen the mother carrying nesting material, hence our doubts. Live food usage started to drop and as the days went by without the young bird leaving the nest we began to wonder if all was well. On the 12th July I checked the nest again and again touched a warm silky bird.

The next morning at 7 a.m., the 21st day after hatching, a young robin-like bird was seen in the flight. It was spotted buff with darkish streaks on the head underparts and back. The tail, about $\frac{3}{4}$ in. long, was all grey as were the wings. No second fledgling was found though we searched the flight from end to end. It was on a high perch at 2 p.m. and at 7 p.m. we shut it in the shelter with its parents just to be safe! There was only one unhatched egg (instead of the expected two) in the nest, so another search of the flight was made. We then let the cock out for a while knowing he would feed it if there was one, but he only fed himself. The egg, which I broke getting it out of the nest, is a pale shade of green with a light brown mottling mostly at the large end.

Next day was cool, 58°F maximum, and very wet, but the parents saw it that the young bird stayed under the covered section of the flight and did not get wet. As the weather got worse in the afternoon we shut all three birds in the shelter and were able to observe it being fed with mealworms by both parents. The locusts were too large by this time,

but even so, the adult birds broke them up and swallowed them themselves—about eight, (fourth instar), went during the afternoon. The next three days were warm and included a two-hour thunderstorm from which all three birds sheltered. The hen was now rebuilding her nest and on the 19th July one egg was laid. The male parent was now doing most of the feeding and with a second clutch in the offing we dare not cut down on the mealworms in case they ceased to feed the young bird which was now flying strongly but as yet unable to feed itself. From the 20th July we stopped shutting the three birds in the shelter at night. The next day there were two eggs and a third on the 23rd July when the hen started incubating. The young bird had grown a lot and was very active. While the hen incubated the male did the feeding until the 28th July when we noticed she kept coming from the nest to feed the gaping youngster which the male was now ignoring. It was now time to separate the young bird, which we did at 6 p.m. and caged it well away from the hearing of its parents. It ate only a few mealworms up to 10 p.m., three from 5.30 a.m. next morning to 10 a.m. and 30 mealworms from 10 a.m. to 1 p.m.. From then on it was no trouble and within two days we had it eating the usual insectivorous mixture plus eight mealworms three times daily.

On the 4th August an eggshell was found in the flight, the 13th day after we thought incubation had started. I checked the nest on the 10th August and felt one chick and two eggs so it looked as if the other two eggs had been chilled as a result of interrupted incubation. On the 22nd August the fledgling left the nest, the 19th day after hatching. We did not shut the young bird or the parents in the shelter this time and noted that it returned to its nest many times and we believe it roosted there at night with the mother. On the 1st September there were two cold eggs in the nest and the hen commenced incubation on the 3rd September. We separated the young bird on the 5th September, the 15th day after leaving the nest. It was feeding itself within two hours. We checked the nest on the 15th September. There were three eggs again. One chick hatched on the 17th September, 15 days after we thought incubation had started. A second chick hatched later possibly next day and the pattern of feeding followed as for the previous clutches. After the hot summer we were now in a spell of storms and cold nights with night temperatures on occasion as low as 40°F. However two Silver Birds left the nest during a mild spell on 6th October the 20th day after the first chick hatched. It does seem that the extremes of weather made little difference to the incubation periods of 13 to 15 days and in the time to leave the nest, 19 to 21 days. I think supplying locusts gave some variety to the live food, mostly mealworms, and helped a lot in rearing these birds. With the latest two birds we did not shut them in the shelter until two days ago (11th October) when cold easterly gales and heavy rain compelled us to.

The Silver Bird hatched on the 23rd June is now moulting in an indoor light in our birdroom. It still has some feathers to come but the spots have gone and the underparts are the same deep tawny as its parents. Also, like its parents, it is grey above with dark grey primary feathers. The Silver Bird hatched on the 4th August is now half patchy grey on the head and back replacing some of the fawn spots. It is still spotted fawn underneath but tawny feathers are spreading from the vent area. It is similar in length. The tail feathers are dull grey and the primaries a dull dark grey. All four young birds are in fine condition.

Last year we ordered another Silver Bird to try and make up two pairs. It arrived from Kenya about two months ago. We think it is a male and has been caged with the old 1966 hen ever since. They agree perfectly. Next year we hope to give her another chance to breed in an aviary with her new companion.

As described above, the Silver Bird, *Empidonax semipartitus*, has been bred by Mrs. K. M. Scamell. It is believed this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

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BREEDING THE RUBY-THROATED OR BLACK-CRESTED BULBUL, *Pycnonotus melanicterus*

By MRS. K. M. SCAMELL (St. Keverne, Cornwall, England)

For some years when we lived in Newdigate, Surrey and since in Cornwall, we have kept in our aviaries a few Bulbuls of the species *Pycnonotus melanicterus*. Sometimes the birds are advertised for sale by dealers, but generally they have been difficult to purchase in this country. Some of these Bulbuls have had small raised crests, others have been crestless or almost so. One feature those we have kept had in common, was a ruby or red coloured throat.

The earliest importation into the U.K. of the Ruby-throated Bulbul is believed to be in 1904 and the aviculturist who kept them, Reginald Phillips, reports his experiences with the two birds in *Avicult. Mag.* 17(1908-9) : 215-219 : 236-240. I am also indebted to Dr. Colin Harrison for clarifying the present grouping of the various races of these bulbuls and I cannot do better than to quote from a recent letter he sent me in reply to my enquiry on the matter:—

“The taxonomy of the bulbul is rather complex. All forms are now grouped as the species *Pyconotus melanicterus*, which is given the name black-crested Bulbul, probably a better one in view of the variation in throat colour. There is a yellow-throated, non-crested form in Ceylon,

and a yellow-throated crested form in Borneo. There is a red-throated crestless form in South-West India, a red-throated crested form in Eastern Thailand, and a red-throated orange-breasted form in Java (*dispar*). The remaining forms are black-throated and the crest is developed to varying degrees. At present 12 races are recognised by name."

Our Ruby-throated Bulbuls measure about 7 in. in length. The head, nape and beak are black. The back, wings and tail are dark olive-green and the underparts pale yellow. The legs are brownish and the throat feathers, some of which tuft or bristle, are a deep red or ruby colour which fades somewhat in captivity. The iris is yellowish. The call sometimes has a single note and at other times a pleasing bubbly one or many notes. There is no territorial song.

We have found them reasonably hardy once established, although in winter it is essential to provide a minimum temperature of 45°F in the shelter. Feeding is simple—an insectivorous mixture (we make our own) into which we grate carrot and apple until it is nicely moistened. We then add soaked currants, cut-up soaked sultanas and cut-up figs and grapes. All the fruits are well dusted with Gevral-Protein. Maggots are not eaten and at times mealworms are also ignored or just a few taken. We have tried small locusts but these have been left also. During breeding periods mealworms are sometimes taken in quantity.

We purchased our first pair of Ruby-throated Bulbuls in 1964. From what country any of this species came from we have never been able to find out. This particular pair were of one of the crested races but it was not until 1966 that they showed any interest in nesting. As this came to nothing we moved them to a larger aviary planted with bamboo, rhododendrum and privet. It measured 20 ft. in length, 4 ft. in width and 6 ft. 6 ins. in height, with a shelter measuring 4 ft. × 2 ft. × 7 ft. high and this they had to themselves. In May 1966 they were again seen carrying dried grasses to an open-fronted nest-box placed high up near the roof of the flight and concealed somewhat by privet. On 3rd June a broken egg was found in the shelter and after about 10 days a check showed an incomplete nest in the nest-box as in the previous year. As the nest-box was on the large size we squeezed inside it a part of a disused thrush's nest and inside that was placed an old warbler's nest. On the 25th June two eggs had been laid in this improvised nest. Then followed normal incubation by, we think, the hen (the sexes are alike). Both eggs hatched on 8th or 9th July. We gave mealworms in addition to the usual food and the mealworms were seen to be fed by one of the parents perching on the ledge of the open front. It was easy to shut the parents in the shelter and check the nest and this we did every other day. The weather was very hot. We tried extra fruit such as diced pear. The mealworms taken were very few, perhaps 30 per day but much of the fruit was taken. We wondered if they were getting other live food such

as caterpillars as the aviary was on the fringe of our wood. Both young birds left the nest on the 20th July, the 12th or 13th day after hatching.

The fledglings were very attractive with dull black caps, white gapes, olive green mantles, and dark olive-green wings, and were creamy underneath. They were quite small with tails about 1 in. long. They perched in the privet and were able to fly short distances only. About 12 mealworms were taken that day but the next day over 50 mealworms went. We had gone through a very warm spell, temperatures being generally in the high seventies or low eighties F., and the inevitable thunderstorm broke on the late afternoon of the 22nd July. Searching in the aviary we found one young bird beaten to the ground and dead. We shut the survivor and its parents in the shelter. Next morning it seemed very fit and perched high and as the weather had now cleared up we let the three birds in the flight but shut them in the shelter for the next two nights. On the 25th July I didn't like the look of the young bird, it was very hunched and stayed in the shelter so we shut the parents in with it. It was not being fed so nothing could be done except to put it into a hospital cage and try to hand-feed it. However it died in a few hours and from the colour of its droppings it was apparant that it had enteritis.

The parents soon began nesting again, incubation commencing on the 3rd August and one chick hatching out on the 17th August. Another egg remained unhatched. Feeding was as before but three days later a dead chick was seen in the flight. The old nest-box was removed and replaced by a new and smaller one. The Bulbuls took to this at once, completing a small cup shaped nest, and were incubating two eggs by the end of the month. These hatched on the 12th September. Again the food was as before and the parents birds were both seen feeding. Again the chicks were thrown out, this time five days after hatching.

The male parent died the following April, but we managed to purchase another bird (sex unknown) later that year. This bird however, was crestless and its yellow colouring was paler. Early in 1970 I had the misfortune to break a bone in my right knee and this resulted in some stiffness in the joint and made it difficult for me to climb the staircase in our house so we decided to move to a bungalow in an area where the winters were milder and the summers not quite so hot. Later that summer we purchased a property in Cornwall close to the sea. Though we are much more exposed to winds and storms than we were at Newdigate, our avairies are all protected from South-Westerly winds by high screens of evergreens such as Escallonia, Eucalyptus etc.. We moved here in October 1970 with about 50 softbills and nectivores and with our best aviaries in sections! It took the next 12 months to erect and plant the 20 aviaries we now have, so 1971 was a blank year for any successful breedings. The old crested hen died in 1972, but we were fortunate in obtaining three more of the uncrested form, two from a dealer both freshly imported) and one from a Zoo (acclimatised). We now had the

possibility of two pairs but it was too late in the summer of 1972 to expect any nesting in the aviary we gave them. This has a flight 12 ft. long \times 3 ft. wide by 6 ft. 6 ins. high and a heated (45°F minimum) shelter 3 ft. \times 3 ft. \times 7 ft. 6 ins. high at one end. It is planted with a griselinia, a conifer and furthest from the shelter a *Lonicera nitida* and a *Senecio*.

Three of the birds spent the winter in this aviary and all seemed to agree, at least until the Spring. The fourth looked miserable and was caged in the birdroom. In the shelter was an open-fronted nest-box and a felt-lined canary nest-basket, in the flight an open-fronted nest-box. On the 24th April 1973 one of the three Bulbuls was seen in the nest basket and on checking this I found one egg. A second egg was laid the next day. Incubation continued until the 5th May when one egg was seen on the floor. The other egg was in the nest but punctured. The eggs measured 22 mm \times 15 mm. They were dark brown at the broad end with an off-white background flecked brown at the pointed end. By this time we had removed one of the three Bulbuls as it was being chased from the food pots. It was placed in a nearby aviary to join No. 4 which had overwintered in a cage. In late May one of the first pair was seen carrying dried grasses to the *Lonicera nitida* bush which was then about 4 ft. high and in which was built a very small cup-shaped nest entirely of dried grasses. Two eggs were laid and as the nest was entirely exposed to all the elements a sheet of clear corrugated plastic was fitted to the roof netting frame. Two chicks were hatched on the 14th June and the incubation period was either 13 or 14 days. We supplied the usual food plus about 50 mealworms most of which could have been eaten by the parents. All the mealworms were very lightly coated with vegetable cooking oil and as lightly dusted with Squibbs "Vionate" a mineral-vitamin supplement. Within three days we were feeding 100 mealworms a day. The weather was warm but unsettled on the 19th June when, with the parents in the shelter, I had a look in the nest. Both chicks were growing well and were heavily quilled. Another warm spell followed—where we live the shade temperature so far has not exceeded the low seventies F., but with the intense sunshine it always seems warmer than similar shade temperatures in Surrey. By the 23rd June, the 10th day after hatching, the chicks were almost fledged. Mealworm consumption had dropped from a high of 150 per day to about 100. Early on the 25th June, the 12th or 13th day after hatching, both fledglings left the nest. It was raining at 11 a.m. and as we were going out for the day, we shut the parents in the shelter, caught the young birds and put them in the shelter also. On our return in the evening they were on a low perch and from the droppings we were satisfied they were being fed. We kept the four birds in the shelter until the 29th June. At night all four would be on the topmost perch, the two young in the middle and one parent either side, a pretty sight! Other food was now being taken in addition to about 100 mealworms per day. The young birds differed

from those bred in 1967 from "crested" parents in that their underparts were whitish and not creamy-yellow. They could fly fairly strongly in and out of the shelter, but at night we shut the shelter door. They were by then invariably perched inside close together like peas in a pod. Observations over a period of an hour on the 3rd July showed that both parents were still feeding them mostly mealworms. From now on we rationed the mealworms so that they had none for four or five hours a day. This pushed up the consumption of the other foods. The white gapes were disappearing, the birds grew very fast and were almost as large as their parents by the 9th July. On the 16th July, the 22nd day after they had left the nest we shut the parents in the shelter and carefully caught the young birds and caged them some distance away. They were feeding themselves within two hours, eating all the soaked currants first. Though they were offered mealworms strangely enough they didn't touch them, and only after they were moved to an indoor aviary in the birdroom about two weeks later, did they sometimes steal one from a flycatcher sharing the same aviary.

The parents took the separation of their youngsters very badly, looked very miserable for some days and then moulted some of their tail feathers. We didn't expect that they would nest again this summer but by the middle of August the hen was incubating two eggs in a new nest about 18 ins. above the old one and in new growth. It was a few inches from the top of the shrub and even more exposed to the weather than the first nest. On the 30th August one chick hatched the other egg remaining unhatched. I removed this egg in about 10 days. All went well until the 12th September when the young bird should have left the nest. It seemed not quite fledged and slept a lot. We could see it through the netting from the path. Its breathing was very rapid and though the parent brooded the bird almost continuously, mealworm demand had dropped to very little and we formed the opinion the bird had been chilled on the nest during the night which had been cool. Two days later it was found in the flight dead. As I mentioned earlier, the nest is a very frail affair measuring about $3\frac{1}{2}$ ins. across, 2 ins. in total depth and less than $\frac{1}{2}$ in. thick. Its not lined, just coarse dried grasses. For success it seems it needs two chicks in the nest and warm days and nights such as we had in June and July. The two young birds which are independant have yet to moult but they have gradually become pale yellow underneath. The ruby or red throat is as yet absent though a deeper yellow than the underparts. The second adult "pair" have not nested.

As described above, the Black-crested Bulbul, *Pycnonotus melanicterus*, has been bred by Mrs. K. M. Scamell. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

BREEDING THE RED AND YELLOW BARBET

(*Trachyphonus erythrocephalus*)

By M. D. ENGLAND (Neatishead, Norfolk, England)

The genus *Trachyphonus*, the so-called "ground barbets", is confined to Africa south of the Sahara and consists of five species—D'Arnaud's, Yellow-breasted, Red and Yellow, Levaillant's and the Yellow-billed—the last of which is sufficiently different for it to be placed by some authorities in a genus of its own, *Trachylaemus*. The first three are birds of dry scrub areas and thorn savannas, while the last two prefer more wooded country.

The Red and Yellow Barbet lives up to its name and is a brightly-coloured bird clad mainly in red, yellow and black. The body is basically yellow, with black mantle and wings which are heavily spotted with white; it has red cheeks connected by a red band passing over the rear of the crown, a good deal of red on the upper breast and ventral areas, white cheek-spots and a tail which is barred black and white. The feathers of the crown are erectile. The male differs from the female in being generally brighter in colour and in having a black fore-crown and throat patches; both have a variable black and white breast-band. The species is locally resident from Somaliland and Kenya to north-eastern Tanzania; it is common in some parts of the Northern Frontier province of Kenya.

My Red and Yellow Barbets were sent to me from Kenya under licence by Tim Barnley and received at his hands the same meticulous attention and care in packing as he appears to give to all his birds, with the result that they arrived in perfect condition. They were placed in a section of birdroom about 6 ft × 5 ft. by 8 ft. high, with access to a 20 ft. flight. Because of very poor April weather they were kept inside for the first week or so, but seemed so fit that they were soon allowed into the flight. A nest-box 10 ins. × 10 ins. × 7 ins. was provided and they immediately took to roosting in it. From the start they returned to the shelter each night of their own accord and needed none of the wearisome chasing indoors which so many birds require. On the other hand they rarely go inside during the day except to feed, however bad the weather.

I have never known birds to thrive on so little food. They were offered mealworms, maggots, locusts, soft food, and fruit of many kinds, with occasional grated cheese and egg-yolk. At first everything was ignored except mealworms, but they settled down to a diet of a few of these, a fastidious peck at the soft food and diced fruit, with one or two maggots when they had finished their mealworms. Of course they are never denied food, but they appear to need incredibly little.

These birds are well-known as duettists, and almost immediately after arrival they started their interesting and amusing performance of sitting



Red and Yellow Barbet—male



Red and Yellow Barbet—female

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side by side, beaks slightly up-tilted, ecstatically "shouting" (this really the only appropriate word) at each other an unmusical cackle. It is initiated by one bird but taken up at once by the other, *in different tempo*: while one is singing "titti-poo-too" the other keeps up "chock-er-chock-er". Most of the time they face each other, but as the paroxysm proceeds they rotate their heads to and fro, looking remarkably like the mechanical singing bird which provides the "signature tune" to the television programme "Going for a Song". This song is subject to considerable variation, since it is sometimes performed by a party of birds in chorus and the duet sung by one pair of birds may be very different from that of another pair. The song of my pair, for example, is quite unlike that of the pair which may be seen and heard in Alan Roots' magnificent film "The Baobab Tree".

They pose an avicultural problem since they are normally bank-nesters, boring a hole in earth or sand or termite-nest, like a kingfisher, and the particular aviary in which they were housed was quite unsuitable for the building of artificial banks such as are provided at, for example, "Winged World". As a substitute a bale of tightly compressed peat was set up with a tunnel and partially-excavated nest-chamber. To prevent the birds of falling in, an upper lining of black plastazote was fitted. In case this was not to their liking, five different types of nest-box were hung in various positions; two were given a cursory inspection, but otherwise all were ignored.

Their song continued for the rest of the year and through the winter but in early spring was performed less and less enthusiastically and very frequently. It was noticeable too that no longer did they perch side by side but one would sing in the flight and be answered by the other in the shelter. They seemed to be losing interest in each other and certainly showed no inclination to breed.

About mid-March the song ceased altogether, which made it all the more surprising to see, on the last day of March, the male pecking the female's head, then strutting in front of her, head and tail raised, and attempting to mate with her. However, it seemed to be a solitary effort and they settled down once more to ignoring each other, one sitting in the flight, the other remaining in the shelter.

On 7th April I was amazed to see the female leave one of the nest-boxes in the shelter, whereupon the male immediately flew up and took her place inside. He remained there for as long as it took me to feed the birds in all the sections of the bird-room and it was obvious that their apparent indifference was a cloak for serious nesting operations.

Both birds incubated the eggs, the male taking a major share during the daytime. Since I am not sure when it started, I do not know the length of the incubation time, but by 17th April the nest undoubtedly contained young because the parents were taking turns at carrying mealworms up. They were good parents, feeding the young at frequent intervals with

food carried in the bill. Mealworms were taken whole but mandibulated to soften them; small locusts had all legs removed and full-grown ones had their wings torn off before being given to the young. The method of doing this was interesting and similar to that adopted by hoopoes and some other birds; the locust was taken down to the ground, seized by the leg or wing and violently shaken until the body came off, sometimes being thrown right across the shelter with the effort. It would then be grasped by another leg or wing and the process repeated until the body was devoid of appendages, when it was held longitudinally in the bill and carried to the nest in that position. On the other hand, mealworms were held transversely.

By 7th April a youngster was looking out of the hole and two days later it was out, to be followed by the second (there were only two) in another couple of days. They were immediately sexable as male and female, being smaller and slightly paler editions of their parents, or having the male's characteristic black crown and throat marks.

Both parents continued to feed them well, at first on the ground and later when they perched. Curiously enough, although they ate them the young were not very keen on the locusts which their parents always chose to offer them when they were available; the youngsters obviously preferred mealworms to everything else. The first out did very well for a week, when it began to decline and eventually succumbed at five or six weeks old. The young male rapidly became self-supporting and had to be removed to another aviary when his parents showed signs of starting another nest.

To make the record more complete it should be added that, prior to their second brood, a great deal more courtship was seen. The male frequently fed his mate, sometimes stealing a locust which she was preparing to eat in order to offer it to her. There was much head-pecking as they perched side by side, although again their duetting ceased. Mating was seen twice with little preliminary while perched, but the male usually prefaced an attempt at coition by strutting round the female on the ground, tail cocked up, with increasingly frenzied head-pecking until as she crouched low *he stood astride her, feet on the ground*, until he actually mounted and grasped her as the act was completed. He looked comical like a tall man whose feet reached the ground while riding a small pony.

REFERENCE

ARMSTRONG, E. A., 1963. A study of Bird Song. O.U.P.

As described above, M. D. England has bred the Red and Yellow Barbet, *Trachyphonus erythrocephalus*. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Assistant Editor.

THE DWARF (RED) TURTLE DOVE

(*Streptopelia tranquebarica*)

By S. B. KENDALL (Chertsey, Surrey, England)

As its English names suggest, *Streptopelia tranquebarica* is a member of the large group of "ring-necked" doves of which the domesticated Barbary *Streptopelia roseogrisea* and Collared dove, *Streptopelia decaocta*, are well known examples. It is however much smaller than either of these, being only about nine inches long and is probably unique in the group in having a well-marked colour difference between cock and hen.

Cocks have an ash-grey head down to a black collar round the hind neck. The rest of the upper plumage is wine-red except for a dark grey patch at the base of the tail. Wings and central tail feathers are brownish but the three outer pairs of tail feathers are black at the base and white at the ends. The lower parts are mainly wine-red. Hens are brown-grey with a black collar similar to that of the cock. Young when they leave the nest are uniformly brown without a black collar but this soon starts to appear. Cocks moult into red plumage in the autumn or winter of the year in which they are hatched, i.e. the first moult, the exact time depending on whether they are early or late hatched. If young cocks are examined in early autumn a few red feathers may be apparent.

According to Whistler (1941) the bird has a wide distribution throughout Asia and parts of China to the Philippines and there are three recognized races of which the one from Assam and Burma is most richly coloured. My original stock probably came from India but more recently I bought a pair in which the hen was distinctly darker. The cock with which she arrived was certainly of excellent colour but this does vary between individuals and according to age in my home-bred birds. However these may well have been the Burmese race.

The Red Turtle Dove has been known to Aviculture for a good many years and a Miss Rosie Alderson (1913) who was an enthusiastic and successful dove-keeper wrote a laudatory account of "this beautiful little dove, very small, trim and graceful in shape" in the AVICULTURAL MAGAZINE, the articles being later reprinted in a volume called *Practical Bird-keeping* which was edited by J. Lewis Bonhote. Miss Alderson refers to the birds nesting freely but not always rearing. I have not traced the reference but I believe that elsewhere she does report successful rearing. There are probably earlier references.

I have now kept the Red Dove for about 13 years, breeding successfully nearly every year and now having a well-established stock. Some account of the birds' activities may be of interest to fellow Members of the Society.

I have never seen the species in the wild but Whistler (*loc. cit.*) gives a useful account from which it appears that it is less conspicuous than the

other common doves of India occurring usually in single pairs, away from villages but in all sorts of country except extreme desert and heavy forest. Occasionally large flocks occur and these may consist of all males.

Importation into Britain is sporadic. I remember seeing what were described as "Burmese Red Doves" advertised in *Cage-Birds* soon after the war when importation was just being resumed and I was thinking about resuming bird-keeping, but it was not till later that I bought four pairs (probably from India) as a breeding nucleus. There were the usual troubles with imported birds. All four cocks died from ornithosis, one hen succumbed to some other cause and as no more imports appeared I was left for a year or two with three widows. However I was eventually able to exchange one hen for a cock and to buy another. These birds provided the nucleus for a stock which, while fluctuating widely over the years, has with one infusion of fresh blood survived to the present day.

As has been indicated the species has the outstanding merit of being readily sexed on colour. Old hens tend to look pinker than is typical, particularly on the breast, and some cocks are less red than others but the distinction is usually very clear. In captivity flocks of mixed sex can be kept together outside the breeding season but when breeding, as with most doves and indeed with most birds, they do best as isolated pairs. I have had limited breeding success with a small flock (three or four hens with rather more cocks) in a shed and attached flight with a total floor area of about twenty-four square metres but the occasional bird is liable to be persecuted. In a confined space unacceptable persecution may take place. I have recently had two pairs breeding very successfully in a total floor space of ten square metres but one pair established territory outside and the other inside the shelter. There was no evidence of persistent fighting. Your birds were tolerated, but were removed within two or three weeks of leaving the nest.

Red Doves build for preference in an open site although I have had them nest in a covered box. The nest is initially of the classic dove type—two crossed sticks on which the eggs are balanced. I usually try to persuade them to nest on a piece of half-inch wire mesh or to replace the nest they build with one of netting. With luck, however, the bird will nest more than once and the nest may be used again and become more substantial as the season progresses, partly as the result of the accumulation of droppings.

The normal clutch is two eggs. Whistler (*loc. cit.*) says that three may occur. I once fostered a spare egg to make a clutch of three all of which hatched, but one young bird died after a few days. Young doves normally orientate themselves in the nest in head-to-tail fashion and when three were present there were clearly complications, and, it seemed to me, unusual activity while they tried to arrange themselves suitably. Barbados Doves are capable of hatching and rearing Red Doves in spite of the latter being so much smaller, but in my limited experience there is a high

percentage of failure.

The incubation period is about thirteen days and the young grow very rapidly; particularly, so it appears, for the first week. At about ten days there is a tendency for babies to hop out of the nest. This should be avoided if possible by leaving them strictly alone. If a bird should leave this stage, or even wander a little from the nest platform it will probably not be brooded and will die unless put back. Brooding is shared between cock and hen in usual pigeon fashion, the hen taking the night shift. Young leave the nest at about fifteen days after hatching and are self-supporting soon afterwards. My records on this are not exact. Birds do not interfere with rings put on after fledging.

A pair that starts breeding in May, which seems to be the norm in southern England may well rear three broods in the season but there are of course plenty of opportunities for accidents. Birds live and continue breeding for a number of years and a three or four year old hen is probably a better breeding proposition than a first year one.

My birds have unheated sheds to roost in and appear to be completely winter-hardy. Feeding is easy. They seem to accept most grains up to the size of the components of "mixed chicken corn" *i.e.* a mixture of wheat, cracked maize, oats and barley, the two former being much preferred. A commercial "canary mixture" is much enjoyed. Clearly real mixtures may prove inadequate for breeding although doves seem less susceptible to the deleterious effects of low protein than some species. I feed turkey starter crumbs with the cereal mixture and sometimes bread and milk and hard boiled egg but it is difficult to say how much they take.

To me *S. tranquebarica* is a very delightful bird and a very satisfactory aviary subject. A drawback, which has been more apparent to others who have kept the species than to myself is its typical dove-like tendency to panic when disturbed. Birds in a confined space may fly directly at the disturber and escapes can occur. In a larger area they may hit the end of the flight uncomfortably hard and damaged heads and wings result. However, if treated gently in quarters to which they are accustomed their nervousness can be overcome.

The need to establish in captivity and regularly to breed foreign birds in order to avoid dependence on continual importation is a fashionable doctrine with unfortunately more advocates than exponents.

The Red Dove seems to be a very suitable subject for ultimate domestication.

REFERENCES

- DERSON, MISS ROSIE. 1913. In *Practical Bird-keeping*. Ed. J. Lewis Bonhote. (London: West, Newman and Co.).
- HISTLER, HUGH. 1951. *Popular Handbook of Indian Birds*. 3rd Edn. (London and Edinburgh: Gurney and Jackson).

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SCRATCHING AND PREENING POSTURES IN HUMMINGBIRDS

By A. J. MOBBS (Walsall, Staffordshire, England)

Although I am unaware of any hummingbird species which indulge in mutual preening, after studying these birds for a number of years, I have learnt it is unwise to generalize with this family, as the Trochilidae are so diverse, there is almost sure to be a species which will prove any generalization to be incorrect.

It is safe to assume the majority of hummingbirds do not indulge in mutual preening, and because of this have evolved highly developed scratching and preening postures. To the casual observer, the minute legs and feet (of most species) would appear to be of little use other than for gripping a perch. However, if one is prepared to study these birds more closely, it will be seen how well adapted for preening the feet have become.

As with most birds which do not (or are unable due to being house alone) indulge in mutual preening, the hummingbirds preen the head, neck, chin and upper throat with their claws. Long billed species preen certain other parts of the body also in this way.

The Swordbilled Hummingbird (*Ensifera ensifera*), due to the extreme length of beak, is unable to reach any part of its anatomy other than the wings and tail, and even these feathers can only be run through the centre of the beak as a whole, not individually as with other hummingbirds. Because of the length of beak and the problems entailed, the legs and feet of the Swordbilled have extra manoeuvrability, thus enabling the species to preen areas it could not otherwise reach.

It is quite an experience to watch a Swordbilled bathe and preen and the first time I witnessed such an occurrence, I was amazed as to how well the bird's legs and feet are adapted for such work. As far as I am aware no other species of hummingbird is able to preen the centre of the back or vent feathers with its claws as the Swordbilled does.

A friend informed me that a Swordbilled owned by him was seen to preen the primaries also with its claws. Certain hermits (*Phaethornis* and *Glaucis*) will preen their wing coverts with their claws, but I have yet to witness a hummingbird preening its primaries in this way.

Several other species, due to the length of beak, have to use their claws a great deal. Many of the hermits (both *Phaethornis* and *Glaucis*) can be seen to scratch-preen regularly; in fact, a female Long-tailed Hermit (*P. superciliosus*) in my collection often scratch-preens areas which cannot be reached just as easily with the beak.

It is often stated that in common with most other birds, the hummingbirds bring the foot up and over the wing when scratching. As with most

generalizations appertaining to this family, this one is incorrect. I will see it is more usual for most hummingbirds species to bring the foot up and over the wing. However in many long-billed species the foot is brought up and under as often as it is brought up and over.

Due to the way in which they are constructed, many hummingbirds assume most exaggerated preening postures. The neck appears to be exceptionally flexible and when certain species preen the wing butts or the upper (and lower, according to the length of beak) breast, the neck may be stretched to three or four times its usual length. The neck is also stretched during certain scratching postures and I have a number of most amusing colour transparencies showing a female Blue-fronted Scaupbill (*Doryfera johannae*), with the neck stretched out of all proportion while scratch-preening the lower hind neck.

I have mentioned the unique way in which the Swordbilled Hummingbird preens. Another species which has an extremely specialized beak is the Sickbill (*Eutoxeres*). This species, however, appears to find little difficulty when preening, in fact the beak proves to be an ideal tool for such work, and it is only the head, hind neck, chin and upper throat which has to be scratch-preened. Due to the extreme curvature of the beak, the Sickbill does not have to assume exaggerated postures when preening the lower throat and upper breast.

I believe it is possible to place certain scratching and preening attitudes into categories. First there is the posture taken up by a hummingbird which is scratching due to irritation. Under these circumstances the motions although deliberate are usually rapid, the foot being moved extremely quickly. If the irritation is about the head, the bird will while scratching move the head into different positions, thus enabling a larger area to be covered with the minimum of effort. I have noticed that this form of scratching is quickly over and it appears once the irritation has ceased, the bird will cease to scratch.

When scratch-preening, the foot is moved in a more leisurely manner and the bird gives the impression of actually combing the feathers with the claws. Also during scratch-preening the bird's body will often move in unison with the action of the foot; especially when it is the neck feathers which are being preened. It is a most amusing sight to see a number of hummers sitting on the same perch all scratch-preening, as if the perch is a wobble one, the movement of the birds sets it in motion until eventually when a momentum is reached, the birds find difficulty gripping the perch. Scratching and scratch-preening is often carried out on the wing and certain hummingbird species appear to prefer to scratch and/or preen while on the wing rather than when perched, even though such an activity appears extremely difficult to human eyes. With irritation scratching, it is usually the head or beak which is attended to, and a male White-bellied Woodstar (*Acestrura mulsani*) in my collection, will purposely leave the perch to scratch its head and/or beak.

When scratch-preening on the wing, it is usually the breast or abdomen which is attended to, although I have on occasions witnessed hummingbirds scratch-preening the hind neck also. To do this, the foot is usually brought up and over the wing; no mean feat when the bird remains airborne the whole time.

Finally I would like to mention displacement preening in hummingbirds. This occurs when a bird has experienced stress for some reason, and is most prevalent directly after fighting has occurred. It can also occur directly after a bird has been forced to leave a favourite perch—either by another bird or by a human. I have also witnessed displacement preening by a bird which has acted in a way which in human terms would be considered foolish: i.e. miscalculated when alighting on a perch.

Displacement preening appears to be carried out by the claws (even in short-billed species), and as with irritation scratching, is carried out in a rapid manner. However, an aviculturist who has witnessed this activity a number of times should be able to distinguish it from irritation scratching or scratch-preening as the bird's movements will be more jerky and the head in particular will be moved more sharply.

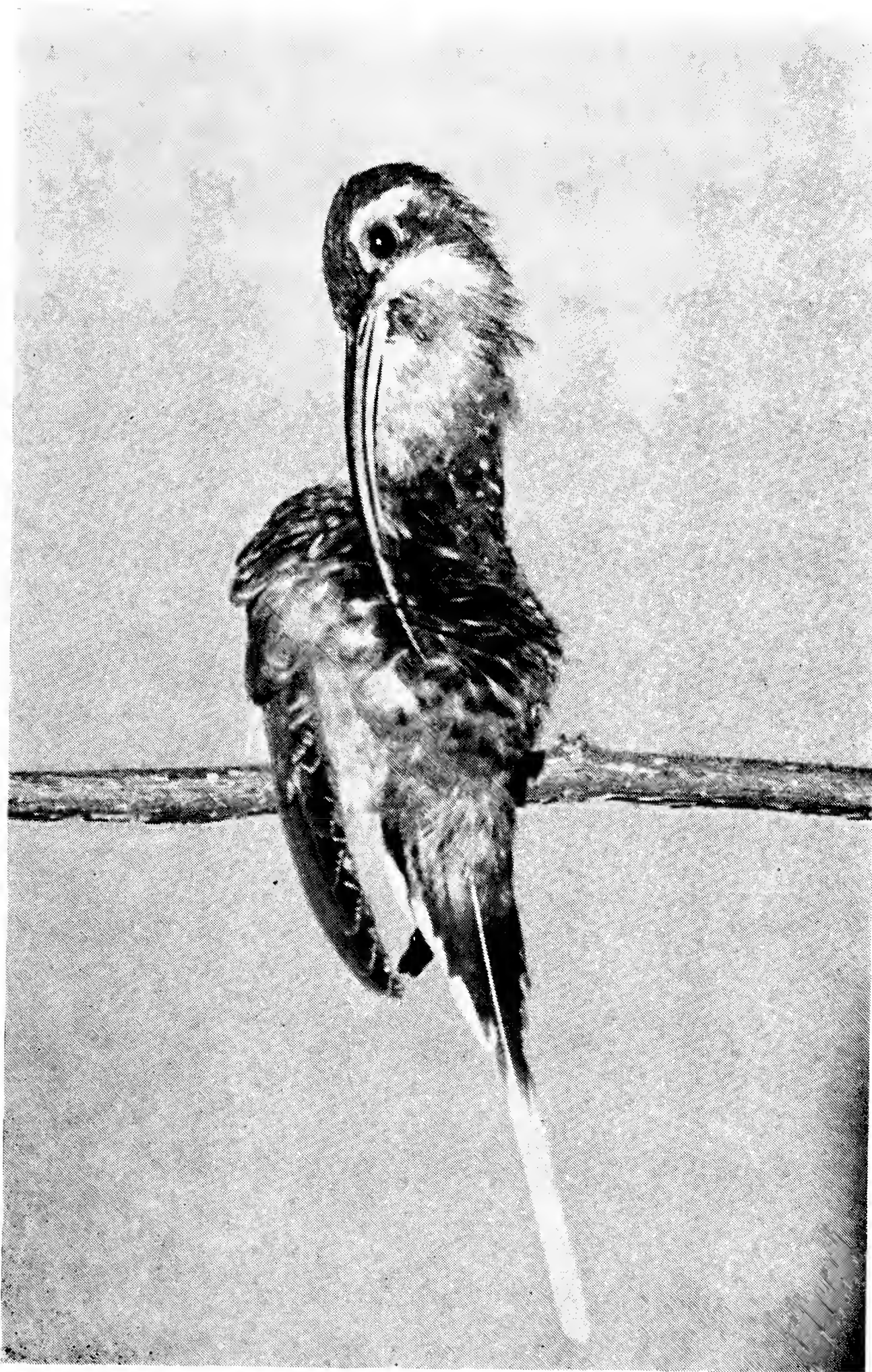
I have witnessed displacement activity in certain species yet rarely ever in others. Pufflegged (*Eriocnemis*) and Sunangels (*Heliangelus*) appear to indulge in this activity more than most, probably because of their extremely aggressive nature. The Rufous-breasted Hermit (*G. hirsuta*) also reverts to this activity regularly.

It appears as well as certain species indulging in displacement preening more than others, individuals from these species may acquire mannerisms peculiar to themselves, but not necessarily to the species as a whole. For example the male Rufous-breasted Hermit in my collection scratches the lower hind neck—usually after showing aggression to other species with which it is housed. When perched this hermit brings the foot up and over the wing or up and under, but when the displacement scratching is carried out on the wing (which is often) the foot is always brought up and under.

The male Tourmaline Sunangel (*H. exortis*) in my collection, also scratches the lower hind neck; this bird always brings the foot up and over the wing. The Sapphire-vented Puffleg (*E. luciani*), although not as consistent as the two previously mentioned species, does scratch the hind neck, but will also scratch the crown during displacement activity.

Displacement scratching and/or preening is known in many other families of birds and I have witnessed the activity in numerous parrot-like species, also in domestic pigeons.

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[A. J. Mobbs

Female Long-tailed Hermit Hummingbird (*Phaethornis superciliosus*) preening.
The area being preened with the beak is also preened as readily with the claws.



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Albino Black-chinned Hummingbird

[Russell Buchan

OBSERVATIONS ON AN ALBINO BLACK-CHINNED HUMMINGBIRD

By KARL-L. SCHUCHMANN (Zoologisches Institut, Frankfurt, Germany)

During a research study at San Pedro, California, on certain ethological aspects of North American Hummingbirds, I was, with the assistance of S. Wells and G. Nixon, able to trap a young albino Black-chinned Hummingbird, *Archilochus alexandri*.

During the early part of July 1972, approximately 15 female *A. alexandri*, were seen to be brooding, or showing signs of nesting, in the restricted area of Averill Park, San Pedro. The nesting sites were close to a small lake and many of the nests were directly above the water. The breeding birds preferred the shrubs of *Senecio petasites*—a plant belonging to the sunflower family—and lower parts of certain willow species.

I first saw the albino Black-chinned in the lower part of an elm tree at a height of about three metres. I had been informed by other observers that the bird had left the nest three days before. Up to this date, the mother bird had fed the young albino regularly every ten minutes or so.

There had been two youngsters—the other being a normal coloured bird—but 24 hours after leaving the nest, this bird was not seen again.

As well as feeding the young albino, the mother hummingbird collected nesting material (hair, spiders' webs and for the external decoration dead cactus cells), and proceeded to build a second nest in an elm some two metres from the previous nest, in which the albino had been raised.

The female Black-chinned laid her first egg the same day as the second nest was completed; two days later, the second egg was laid. By this time the young albino had left the nest six days.

The albino had remained in the same elm since leaving the nest. As the mother bird was now sitting, she was unable to feed the young bird regularly and because of this, the latter was heard to call for food more persistently. The call was made up of a high pitched *ziip*. Sometimes the call would be answered by the mother bird and she would then leave the nest and feed the youngster. However, it was noticeable that as time progressed, the begging behaviour of the young albino became less successful.

Other hummingbirds (mainly immature *A. alexandri* and *Selasphorus s. sasin*) were seen to attack the young albino; these attacks were usually ward off by the mother bird.

Seven days after leaving the nest, the albino was caught with a butterfly net. Permission for this was granted by the United States Department of the Interior Wildlife Service.

From the time of fledging, the albino had been most lethargic and was not seen to inspect leaves or flower buds; an activity observed in other hummingbirds of the same age. Before the bird was collected, it was

noted that the mother bird fed it once only (and then only for a second or so), during a three hour period.

Two days after being collected, the albino died.

Description:

Bill: 1.82 cm (from n.c.) Base deep flesh coloured, less intensive towards the tip.

Iris: Deep red.

Plumage: White.

Extremity: Flesh coloured to red.

Weight: Seven days after leaving the nest (total age 23–25 days): 3.19 g.

Wing length: 4.30 cm.

REFERENCES

ROBBINS, BRAUN, ZIM. 1966. *Birds of North America*, New York.

SCHUCHMANN, K.-L 1973. Albinismus bei Kolibris, *Die Gefiederte Welt*, 97–13.

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BREEDING THE RED-NECKED FRANCOLIN, *Pternistes afer*, AT THE JERSEY WILDLIFE PRESERVATION TRUST

By D. GRENVILLE ROLES

(Deputy Curator of Birds, Jersey, Channel Islands)

Distributed in various subspecies over the southern third of Africa, our three specimens (♂♀♀) came from the vicinity of Luanda in Angola on the 20th May 1971. They appear to be the nominate form *Pternistes a. afer*, Muller 1776.

Description

About the size of a Partridge with the spurred male being noticeably larger than the female, they have the forehead, eyebrow and moustachial stripe white, top of the head brown, neck speckled black and white and the remainder of the upper parts earth-brown with darker shaft stripes. Underparts are broadly streaked with black and white (black shaft stripes with white edges) legs, bill, facial skin and throat wattle coral red. The sound most commonly heard from our birds is a loud "crowing cackle", on a descending scale, usually heard early morning and late afternoon. They are reputed to make "Kek Kek Kek" call in flight, and give their alarm call when perched in trees.

Accommodation and Diet

After quarantine the birds were released into a small aviary approximately 4 ft. × 10 ft. × 7 ft. high, with a shelter 3 ft. deep at the rear. The



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Red-necked Francolin. Age when photographed 1 day.

[Phillip F. Coffey



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Red-necked Francolin. Age 12 days.

[Phillip F. Coffey



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[Phillip F. Coffey

Red-necked Francolin. Age 2 months 6 days.

floor is covered with a deep layer of sand and planted out with *Lonicera nitida* and *Ribes sanguineum*. A rear corner was made private with grass tussocks and clumps of dried bamboo leaves. It was in this corner that a scrape was made and all the eggs were laid. The birds had a constant supply of layers pellets and mixed canary seed. In addition, they received between 20 and 30 mealworms daily and a regular supply of fresh turves which they enjoyed shredding.

Behaviour and Breeding

For convenience the birds were kept as a trio, though almost certainly only one hen was mated with, and certainly only one was favoured, being called to mealworms and other choice titbits by the male. If the other female approached she was given a sharp peck and swiftly chased away, although not pursued. The greater part of their day seemed to be spent skulking amongst the small shrubs of their aviary, the male being particularly lethargic. Great interest was taken in the fresh turves which they regularly received, the presence of the odd female being tolerated at the investigation. Dust-bathing was also taken part in regularly and vigorously, the birds resting periodically during their exertions. The only form of courtship observed was after the supply of mealworms or turves, when the male called to the female with his neck stretched up and forward, all plumage apart from the flank feathers which were fluffed out was sleeked, and he adopted a peculiar high stepping gait around the apparently disinterested, feeding female. The stretched neck of course showed off the naked red throat patch very clearly and the stripes of the underparts were shown to advantage by the upward stretching of the bird. Mating was never observed. The first egg was laid on the 25th January 1972, eight months after the birds' arrival; this, however, was broken.

The first clutch of five eggs was started on the 19th March 1972, eggs being laid on alternate days. A sixth egg was laid on the 4th April. Of these two were infertile and four were dead in shell. The size of the eggs varied from $31-34 \times 38-40$ mm and possessed remarkably thick shells. They were a uniform light brown colour and heavily pitted—each pit showing as a white speckle. Egg production started again on the 7th December 1972 continuing very erratically throughout the first four months of 1973. Forty-four eggs in all were produced of which four only hatched on the 21st May after an incubation period of 23 days. Of the remainder six were dead in shell, three were broken and the others were infertile.

Chick Development

On hatching the chicks' down pattern was as follows: a mid-brown stripe bordered by darker brown extended over the crown to the nape. The back was mid-brown bordered by darker brown next to a buff stripe, a dark stripe separating this from the buff undersides. The face and

neck were a yellow buff—with a darker brown stripe leading from the eye to fork behind the ear. The thighs and wings were speckled and striped. The legs were orange pink and the eyes brown. The bill was a dark horn colour with a darker stripe over the culmen and a dark spot in front of each nostril. The egg tooth was yellow. The initial rearing diet consisted of chick crumbs, mixed boiled egg, bread and milk and "Saval" puppy food.

- 2 days—Well developed pin feathers on wings just starting to open.
- 4 days—Flights opening up a light buff colour, not yet capable of flight—underparts darkening. Boiled egg and bread and milk discontinued.
- 6 days—Bare patch behind eye first noticed. Bill darkening, flights developing—mottled area now visible. Not yet capable of flight. One chick died, no apparent cause.
- 8 days—Flights now reach to end of body. Tail feathers now noticeable. Pin feathers opening up on upper back and shoulders. Bill darkening, legs darker, egg tooth shed.
- 10 days—Capable of flight, primaries extend beyond tail length.
- 13 days—Feather tracks on side of body from neck to rump in pin-feathers—opening on side of neck in black and white spots.
- 15 days—Speckled plumage on sides of body continues to develop.
- 18 days—Bald patch behind the ear enlarging, plumage developing on thighs. Bill completely dark apart from light tip.
- 23 days—Head still unfeathered. Stripe from throat to tail covered with down only. Wing coverts almost fully developed. Ear coverts developed. "Saval" puppy food discontinued.
- 39 days—One chick persecuted by the other two, its back was raw and bloody. Chicks separated. Head feathers appearing, facial skin becoming reddish in front of eyes.
- 45 days—The chicks now look like large Quail. Undersides are light grey spotted with black. Upperparts are a mottled sandy brown. Bill black, face pink above whitish cheek stripe. Legs reddish.
- 99 days—Francolin attacked and mutilated a female Sandgrouse, causing eventual death.
- 106 days—Upperparts earth brown with darker shaft stripes over upperback and wing coverts. Naked patch on throat starting to develop. Bill still black. Striping starting to appear on upper breast.
- 130 days—Facial skin orange-red. Culmen dark and reddish sides to bill small throat patch orange red. Neck speckled. Underparts striped and spotted. Almost the size of the adult females.

SUMMARY

The breeding and rearing of Red-Necked Francolin is described with a total of two chicks being reared. This is the second species of Francolin to be bred by the Jersey Wildlife Preservation Trust. The first being the Red-billed Francolin *Francolinus adspersus* which was bred for the first time in September 1963.

* * *

OBSERVATIONS ON THE BEHAVIOUR AND BREEDING OF THE SAFFRON FINCH

(*Sicalis flaveola*)

By C. J. O. HARRISON (Berkhamsted, Herts, England)

In the early spring of 1973 I received three South American birds of the genus *Sicalis* from Robin Restall in Spain. From their behaviour I suspected that they were two males and a female but there was some doubt about their specific identity. An examination of museum skins showed that they must be Saffron Finches, *Sicalis luteola*. This species had been bred fairly frequently in captivity but, like many other South American species, its behaviour and life-history are very poorly documented and the present account seemed justified.

PLUMAGE

The adults of the species are distinctive enough. The male is green above with faint darker streaking on the lower back and dark inner webs on tail and wing feathers; yellow on head and underside; with saffron-orange on lores, forehead and forecrown forming a distinctive patch. The amount of green tint in the yellow on the underside, head and mantle seems to vary with age. The male described here, newly moulted from immature plumage, showed a distinct green tint over much of this plumage.

The female is olive-green dorsally, with dark streaking on mantle and back, and small fine streaks over the head. Wings and tail are dark with of greenish-yellow feather edges. Lores, throat and underside are yellow and the area around the eye is an unmarked yellowish-green. There may be a faint orange tint on the forehead.

The identification problem arose because the birds sent, although behaving like adults, were in immature plumage. This is greyish-white on throat and underside, save for the upper breast which has a broad band greenish-yellow, the latter continuing as a narrow strip across the upper mantle. The head is grey, slightly tinted buff and with fine dark streaking over the top and nape. The mantle and back are streaked dark brown and tinted yellowish-green, deepest on the rump. Wings and tail are

dark, edged with greenish-yellow like those of the female. The under tail coverts are yellow. The bill of adults is a light buff colour. In the young it is blackish at first, but the lower mandible becomes pale, and is conspicuous in "bill-up" displays.,

In this plumage the birds were singing advertisement song and quarrelling, and one received like this was still in immature plumage six months later. The period for which this plumage is retained, and its relationship to the breeding cycle does not seem to have been investigated.

GENERAL BEHAVIOUR

The Saffron Finch is a typical seed-eating bunting, appearing rather heavily-built and short-necked, and having a short blunt bill. It perches when resting but feeds extensively on the ground, walking with a steady, lark-like stride, and occasionally running. On a perch it will sidle rather than hop. It can cling to a vertical perch and lean out to reach seed-heads. It is capable of making brief, flycatcher-like flights from a perch after small flies. It bathes avidly.

Saffron Finches are aggressive and quarrelsome, both among themselves and with other birds, tending to dominate those placed in aviaries with them. This makes them difficult for mixed aviaries and this, together with their loud and rather monotonous song, probably prejudices aviculturists against them.

FOOD

I can say little concerning food, since the birds were housed with some Painted Quail and for much of the time also with a pair of Spanish Sparrows also present. An aviary seed mixture was offered and maggots and grated cheese were also put into the aviary. The last two regularly disappeared but I could not be sure if the Saffron Finches took any. They certainly took unripe seeds of grasses and herbaceous plants, and small insects, especially when there were young in the nest, but were not seen to take maggots or mealworms until the young of later broods were in the nest.

VOICE

The normal flight call is a "chep" note, sparrow-like but a little more melodious. Birds settling near each other may squabble with a harsher "chuc-chuc-chuc" chattering note, usually accompanied to some extent by the "bill-up" display. A subdued "hueet" call was heard at times from the male, usually when the female was on the nest, and from its context it appeared to indicate slight anxiety. The alarm call, frequently heard, is a short, high-pitched and thin "stit".

Advertisement song is usually uttered from a high and conspicuous song-perch. Although in brief moments of song during other activities only four or five notes may be uttered in a phrase, during more sustained

outbursts the phrases consists of eight to twenty notes. The notes resemble the high-pitched calls made by House Sparrows during their more excited moments when fighting, but are a little more melodious. In a typical phrase the first four to seven notes are loud, sharp and incisive, and are uttered separately as a series of independent notes with apparently random variation in pitch. The remainder of the phrase is similar but the notes are more hurried, less sharp, and sometimes two or three are run together. As a song it is monotonous and the cumulative effect is not melodious.

There are usually periods of sustained song, one long phrase following another in rapid succession, after dawn and just before sunset. The early morning song period may be very long. The period at dusk may be shorter, about ten minutes or a quarter of an hour, but is of very regular occurrence, even in cold and wet weather. During the breeding period there are intermittent outbursts at other times of day and short phrases may occur at any time.

In addition the male also has a subdued song. This is a quieter, sustained warbling of a much more musical type. It is uttered as a continuous flow of soft and melodious but slightly wheezy notes, and may include intermittent low, grating notes. It appears usually to be sung in the presence of the female, and on the only occasion on which an apparent courtship display occurred it was accompanied by this song.

The call of young in the nest is a soft wheezy "tzee-tzee"; and on their emergence this changes to a loud "zwit, zwit-it", harsh, nasal and of moderate pitch, lower than the call of the nestlings.

POSTURES AND DISPLAYS

In general the green and yellow colouring of the adult birds is less conspicuous than might be expected, but the orange forehead of the male appears to have a strong signal function. During advertisement song the head is frequently moved from side to side and up and down as the disjointed notes are uttered, and the frequent sharp movement of this small patch of colour is conspicuous from a distance.

A possible epigamic display was witnessed only once and not clearly seen. The male was feeding on the ground near the female. A more vigorous burst of the subdued song was heard and the male was briefly glimpsed running towards the female, rather upright, the feathers of head and neck appearing fluffed so that the orange and yellow colour was very conspicuous. The wings appeared to be drooped and the tail cocked sharply upwards.

The aggressive nature of this species has already been mentioned. Reaction to other species such as the sparrows was a simple forward threat with open bill. Towards conspecifics the "bill-up" threat posture was frequently used. One bird would settle near another, in a rather upright posture either facing the other bird or laterally aligned to it, and

throw back the head with a quick movement so that the bill pointed straight upwards. Both birds may adopt this posture and one may make a threatening move towards the other, but in general dominance appears to be established without open conflict.

In the male the colouring of the forepart of the head which moves most conspicuously during this display is yellow, with the orange forehead region. In the female throat, lores and around the eyes are unmarked yellow. In the young the throat is white, and the pale buffish lower mandible is more conspicuous during the movement.

BREEDING

When received, in late February, the birds were put into an aviary consisting of a part of a greenhouse 2 ft. 6 in. \times 4 ft. \times 7 ft. high, set in the angle of a wall with the top partly shaded, and opening through a large aperture into a planted flight on a slope, about 13 ft. \times 3 ft. and tapering in height from 8 ft. to 5 ft. Two birds were in immature plumage and the female had mostly moulted into first adult plumage. It was thought that both immature birds sang from high perches in the flight. One was scruffier, having lost many feathers on head and body, and the other was dominant.

During the next two months the first moulted into adult plumage and became the dominant bird, supplanting the other. The female was seen occasionally carrying small twigs. According to the rather sparse literature the natural nests are in cavities. Rolls of wire-netting with long, dead grasses woven into them were put up in the shelter, but the grasses were pulled out and the site ignored. Boxes placed in the shelter also aroused no obvious interest.

In early May a cardboard box with one end partly removed was fixed at the end of a perch in the flight, under a section sheltered by a polythene sheet. The adult-plumaged male sang perched by this box and the female was seen to enter carrying grass blades. Since the Spanish Sparrows were still present a nest was provided for them. This was a section of silver birch log, about 10 in. long by 6 in. external diameter with walls about $\frac{1}{2}$ in. thick. It had been a tit nest-box and the usual round hole near the top was enlarged up to the lid and the whole turned on one side to provide a horizontal cavity with a slit-like entrance on the side at one end. This was hung in an exposed position, on the wire side of the flight, near the door and furthest from the shelter. The Saffron Finches immediately transferred their attention to this. The male sang on top of it or from a nearby perch, and chased off everything else. The Spanish Sparrows went to Herbert Murray who already had a displaying male, and the extra Saffron Finch, who was losing feathers in aggressive encounters and tending to hide, was offered temporary asylum by Leslie Rance.

The singing male finch was seen to pick up fragments of nest material

and hold them once or twice, and in the early stages of nest building was seen to carry material about, but it is not certain that he played any significant part in nest-building. This was done by the female, rather furtively, and a nest became partly visible within the box, at the end furthest from the entrance. An examination later showed it to be a shallow cup of dead leaves and stems and dried grass, lined with finer grasses and feathers. It was so far in that nothing could be seen but by 24th May there were eggs in the nest, the nearest just touchable with a finger-tip. On the Spring Bank Holiday of 26th–28th I was able to observe the female and saw her enter the nest once or twice, but no evidence of brooding. As always the birds were nervous, the thin "tsit" note being constantly heard, but they seemed tamer than previously.

On 7th June when I could feel a young one I realised that each time I or a neighbour appeared in our gardens the male gave the alarm note and the female immediately slipped off the nest and joined him. In view of the amount of time she must have been off the nest it was fortunate that we were enjoying an exceptionally prolonged period of fine hot weather. Incubation must presumably have begun about 24th May. They were more tolerant of birds than humans, for the perch by the nest extended into an adjacent compartment with an Azure-winged Magpie in it, and the constant flights of the latter jogged the nest a little with each movement. Incubation, like building, appeared to be by the female alone.

With the hatching of the young the adults began systematically searching the vegetation of the flight for small insects, but showed little interest in small blowfly maggots when these were offered, although larger maggots were utilized later in the season when the third brood were in the nest. Both adults fed the young. I threw quantities of seeding Forget-me-not weeds infested with aphids into the flight and these were quickly investigated. The young continued to survive, although as in incubation the female left the nest when people were present and showed reluctance to enter with food.

When the young were about six days old I opened the box and pulled one out. It was virtually naked, dull purplish-pink in colour, with a few tiny sparse down tufts on mid-back, one or two on the wings, and a few on the crown of the head. The gape flanges were very pale yellow, the mouth orange. An egg had rolled to the wrong end of the box and was not incubated. It was typical of the species, pale pinkish white, but heavily marked with large spots and specks in dark purplish-brown, hiding much of the ground colour and forming a dense cap at the larger end. There were two young.

On the morning of 22nd the first young one emerged onto the perch by the nest where it sat until late afternoon. Its first flight was quite strong, and it kept to the higher perches. The parents kept up a barrage of alarm calls and when the Azure-winged Magpie in the next aviary showed interest they both flew at it and landed on the wire near it in a manner

suggesting intention of attack. The second youngster emerged next morning and also spent some hours on the perch before moving.

The harsh begging call of the young was heard fairly infrequently. Within two days the hen anxiously inspected the nest-box after I had examined it, and two days after that began to lay, three more eggs being in the box by 29th June, and the last presumably laid on 30th June. The hen showed similar behaviour to her previous incubation although once or twice, on suddenly emerging from the house, I saw her slip out of the nest. The young were fed mainly, perhaps entirely, by the male now. At seven days I saw him occasionally repulse a food-begging youngster, and by ten days they appeared to be feeding themselves, although food-begging could be heard for up to a fortnight.

The second brood had hatched by the evening of 13th July. The parents were again eager for any insects. On this occasion I had some mealworms, and these were taken when offered. As on the previous occasion during the nestling period the adults were seen taking unripe seeds from grasses and weeds in the flight as well as insects. The young of this brood emerged on 29th July, behaving in similar fashion to the first brood. Four young emerged and fledged. The male chased young of the first brood away from the nest-box both during and after occupation by the second brood, but otherwise there was no aggressive interaction with them.

Three days after the second brood emerged the nest had been partly rebuilt, the walls being raised and the cup deepened. The first egg of a third brood was laid on 7th August, young were hatched by 24th, and emerged on 7th September. Five eggs were laid in this instance, and four young hatched and fledged. The weather having turned cooler the nest-box was removed.

Clutches laid were therefore of 3, 4 and 5 eggs; and young hatched and fledged were 2, 4 and 4. Intervals between young leaving nest and the next egg were 4 and 9 days. In the latter stages of the last brood the broken end of the box by the entrance hole fell away and it was possible to see the interior. Throughout the whole period there was complete nest sanitation by the adults both within the nest and the box, and there was no evidence at any time of faeces within the cavity, or immediately below the entrance where they would have fallen if voided at the entrance.

During the period that the third brood were being raised there was some evidence of occasional noisy calling suggestive of song from some of the earlier young. Also during this period the third adult, which had originally been suspected to be a male, and which was being kept elsewhere with some Zebra Finches, indicated its true sex by laying an egg, similar to that of the breeding female but more sparsely marked.

The present data suggest an incubation period of about 13 days, and a fledging period of 15–16 days, followed by about 10 days dependence on the adults. The fledging period seems a little long. It is a difficult

factor to calculate in an aviary breeding since the ease with which the adult can find food and rapidly bring it to the nest may decrease the likelihood that hunger and desire to follow the adult in search of food might help to trigger off the initial departure. From about 10 days onwards the young in the nest seemed to react positively to interference with the box, not by crouching but by huddling back into the darkest corner of the nest and box, the front ones rearing up in the nest to do so. It seems possible that this type of cavity nesting might create a situation where the young could remain longer at the nest site, and be stronger, more active and more successful in their subsequent fledging. They did not appear at the entrance to the box during the days immediately prior to departure as do more typical cavity-nesting birds, and the tendency to merge onto a nearby perch and to sit there quietly for a long period before attempting to move may be correlated with a need for the emerging youngster to become accustomed to entirely strange surroundings.

Although the period of dependence on the adults seems short, after the last brood emerged and (the nest-box having been removed) the female was present with the young, the food-begging call was heard at intervals for almost four weeks, although this does not necessarily imply that feeding occurred. It may be that when the female is not occupied with a new brood she may be more tolerant of the sustained demands of the young than is the male.

* * *

EXPERIENCES WITH CAPTIVE ALBATROSSES

By G. MICHAEL FLIEG (St. Louis, Missouri, U.S.A.)

We first obtained specimens of Laysan Albatross (*Diomedea immutabilis*) and Black-footed Albatross (*Diomedea nigripes*) at the St. Louis Zoo on 4 March 1966. Six specimens of Laysan and three Black-foots were received. These birds were collected after the breeding season was completed and arrived thin and not unusually aggressive. Our initial attempts at hand feeding were in vain. We then force-fed the birds Smelt (*Osmerus mordax*) and squid supplemented with vitamin A and B complex and salt tablets. Salt was given until the birds excreted salt from the nasal gland as described by Frings (1959). After a period of two weeks the birds began to hand-feed. The birds were individually marked with coloured plastic bands for quick identification. Temperament varied within the group. The Black-foots were the more aggressive whereas the Laysan were semi-aggressive to docile. The dainty Laysans were hand-fed by placing the fish alongside the mandible; when the beak was opened, the fish was slid back into the gullet where it was swallowed whole. The Black-foots hand-fed quite differently as the fish were snapped from the hand when held at the end of the mandible and then worked to the

gullet. At this point the birds were taking up to 60 Smelt per day per bird. We then switched to Herring (*Clupea* sp.) which was a much handier size for hand feeding and does not contain thiaminase which destroys thiamine. Occasional squid were given. The birds were hand fed so that each bird's intake could be recorded and observations concerning their individual behaviour could be noted. As albatross are aggressive feeders they should be fed with care. The razor sharp beak and tearing hook are formidable weapons. One keeper sustained a severe bite which became badly infected resulting in a severe case of blood poisoning. The birds were kept in two indoor cages 5×2 metres with access to an outdoor cage, weather permitting. They were given a salt water solution for drinking but were seldom observed ingesting it. Instead they preferred to drink the fine spray of fresh water from a garden hose. By August only three birds were alive and two succumbed before the end of the year; the last Black-foot died in April 1967. The next group of Albatross were received in January 1967, totalling seven Laysan and three Black-foot. These arrived in poor condition, but were quite heavy as they were taken near the beginning of the breeding season. They were very aggressive and difficult to induce to feed. Even when force-fed they refused to keep a single fish down. These birds died in a short time, but we obtained some valuable information. Due to improper packing containers, (cardboard containers were used) half of the birds shipped died in shipment. We also learned that albatross can be overdosed with NaCl.

Our last shipment arrived in December 1969. Well ventilated shipping containers were built, $100 \times 30 \times 30$ cm, with a door on one end screened with 6 cm hardware cloth for ventilation. The birds were never fed or watered in shipment. Six birds, four Laysan and two Black-foots, arrived in excellent condition. Again the birds were over-aggressive and refused to eat. From our experiences thus far we feel that birds taken after the breeding season respond well to our feeding attempts because they are lean and hungry and when the birds arrive at this time the weather is favourable for giving the birds access to the outdoors for at least a part of the time.

All of the birds were promptly autopsied upon their deaths and the following results were recorded. It was found that contrary to popular belief the birds could be saturated with NaCl and three birds were lost due to salt poisoning. Two birds were lost to Nutritional Secondary Hyperparathyroidism, an imbalance of Calcium and Phosphorus. Aspergillosis in the respiratory tract claimed the lives of some birds, and the virus PPLO was responsible for two deaths.

The treatments administered as a result of diagnosis made through observation or autopsy are as follows.

- (1) A severe gastro-intestinal problem developed which caused the birds to vomit all their food. This was diagnosed by autopsy as aspergillosis and was promptly cured in other birds with mycostatin (Mycostatin).

- (2) PPLO virus was found on autopsy. The birds went down in the legs and were listless. Frings (1969) lists this as a sodium deficiency but this occurred when the birds' salt intake was maximum. An oral cortisone (Azium) was administered along with a tetracycline (250 mg Achromycin) twice daily.
- (3) The fish tapeworm of man was eliminated with Purina Poultry Worming Tablets.

Individual specimens of albatross have been kept in captivity for considerable lengths of time. Washington, D.C. kept a single specimen of Black-foot for almost nine years and a Laysan for over two. Brookfield Zoo holds the record for the Galapagos Albatross (*Diomedea irrorata*) at four years, four months. The oldest age in the wild established by banding records is twenty-nine years for the Laysan and twenty-seven for the Black-foot (Robbins 1961).

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REFERENCES

- FRINGS, H. and M. 1959. Observations on Salt Balance and Behavior of Laysan and Black-footed Albatross in Captivity, *Condor*, 61 : 305-314.
- ROBBINS, C. S. 1961. *Western Bird Bander*, 36 : No. 2, 4/61.

PRODUCTS MENTIONED IN THE TEXT:

- NYCOSTATIN — Brand of Nystatin manufactured by Squibb & Sons, E.R., 909 Third Avenue, New York, New York 10022.
- ACHROMYCIN — Brand of Tetracycline manufactured by Lederle Laboratories, 5025 Pattison Avenue, P.O. Box 251, St. Louis, Missouri 63166.
- AZIUM — Brand of Cortisone manufactured by Schering Corporation, 60 Orange Street, Bloomfield, New Jersey 07003.

* * *

BREEDING THE PEACOCK PHEASANTS

By G. MICHAEL FLIEG (St. Louis, Missouri, U.S.A.)

Recently I have had the opportunity to study the captive breeding biology of the Germain's (*Polyplectron germaini*), Gray (*Polyplectron bicalcaratum*) and Palawan (*Polyplectron emphanum*) Peacock Pheasant while working as Curator of Birds—Truli D Farms, Haines City, Florida. All three species were hatched and reared from eggs obtained from seven pairs of Germaine, three pairs of Palawan and three pairs of Gray of various ages. This study is meaningful because of the statistically significant numbers of breeding pairs and data was accumulated on clutch size and clutch intervals in various age birds as well as variations between the three species. Notes were taken on behaviour of the breeding birds and the chicks. I have outlined the procedure for hatching and rearing as well as problems which may occur and their solutions. This account will begin with detailed observations on each species and conclude with general procedures for rearing peacock pheasants. The same procedure may be used for the Roul Roul Partridge (*Rollulus roulroul*).

Generally the Peacock Pheasants go to roost right after sundown. It is at this time that laying hens can be spotted as they stay on the ground rather than going to roost. The hens may appear puffy for a day or two prior to laying. Peacock Pheasant eggs are creamy pink to white in colour. The hen goes to roost after laying or may remain on the egg until it is laid when it is near dark. The nest is a simple scrape usually in the corner of the pen or under vegetation. The Palawan may drop its egg at random. A comparison of the Breeding Data compiled on the three species is shown in Table I.

TABLE I
BREEDING DATA COMPARISON BETWEEN THREE SPECIES OF
PEACOCK PHEASANTS

	Gray	Germaine	Palawan
Number of breeding pairs	3	7	3
Clutch size	1-2	1-2	2
First eggs laid	2/6	2/10	3/5
Clutches produced per pair	3-6	3-6	3-6
Average interval between clutches	13 days	15 days	12 days
Incubation period	21 days	21 days	20 days
Fertility	80%	55%	100%

The Gray Peacock Pheasant is the most docile of the three species. Their pens can be entered carefully without exciting the birds. The cock is bold and doesn't hesitate to display before an audience. The species is the first to lay (Table I). The hen is broody and will protect her second egg. If the eggs are removed, a hen will produce up to six clutches. Yearling pairs are capable of breeding and of three young pairs one produced fertile eggs, the other two did not lay.

The Germain's is the most shy and flighty. The display is rarely seen and most birds are extremely nervous. The oldest hen produced one egg clutches or in the instances where she laid two eggs they were four days apart. All the young pairs laid but the fertility was very poor. Up to 5 clutches can be produced by a single hen. The male Germain becomes quite nervous and vocal when the hen is ready to lay.

The Palawan is between the previous species in temperament. This species displays readily but is a bit shyer than the Gray. The cock takes two to three years to attain its full colour but is sexually mature during the first breeding season. The eggs are 100% fertile even among the year-old pairs. Before the hen lays, the cock becomes very irritable and contrary to his nature is flighty.

Eggs of the peacock pheasants are not stored but set immediately as fertility declines quickly. The eggs hatch in 20-21 days. They are placed in the hatcher 2-4 days prior to hatching depending on the air space in the egg. If the egg is dry and the air space large, it is placed into the hatcher early. If the air cell is small, it is put later or allowed to hatch in the incubator. Eggs are turned 45 degrees three times daily. Temperature in the incubator $99\frac{1}{2}^{\circ}\text{F}$ (37.5°C) and Humidity (Wet bulb) approximately 83°F (28°C). The chicks hatch about 24 hours after pipping. The Palawan chick which is the strongest hatches immediately. The chicks are allowed to dry in the incubator. They are then moved into a brooder box. The box used is 61 cm. \times 61 cm. \times 20 cm. The box is ventilated on three sides. The solid side contains the light bulb which is about four inches from the solid brooder floor. The chicks are started with 100 watt bulb; maintaining the temperature at about $93-95^{\circ}\text{F}$ (35°C). Paper towels are used on the floor. Crumbles Purina Gamebird Startina and Trout Chow are sprinkled on it. Quart waterers are used with marbles placed in the water to prevent drowning. The chicks are started on mealworms; each chick receiving 1-2 worms three times daily from a forceps and are given water from a dropper until they are observed drinking. When newly hatched chicks are introduced to established ones they are placed inside a small circular cage 15 cm. in diameter made of fine hardware cloth. The chick can move around in the mobile cage until the others are used to him. The chicks of the three species are similar in size but differ a bit in colouration and are readily distinguishable to the trained eye. As many as 6-8 chicks can be reared together if they are compatible. We were able to put three-day-old Palawans with 10-day-old Gray and Germain's. The Palawans even at this age are very aggressive and become dominant in the peck order though they are only half the size of the others. Grays on the other hand are the most docile and ignore their cage mates. Male peacock pheasants can be detected as early as three days of age as they display to their cage mates. Germain's are the most difficult to raise and their individual temperaments range from aggressive to docile. This also has to do with

the sex as males are more aggressive. All chicks are handled daily to check the vent and weight. The vent must be kept clean or the birds become constipated. If a bird is encountered with this condition, the water should be treated with Cosa-Terramycin. If crooked toes develop the chicks can be given a 5 mg. tablet of Vitamin B₂ daily—broken into small pieces and placed deep into the throat with a forceps. If the condition is not remedied in 10 days, spread the toes in natural position between masking tape. In another two weeks remove the tape and the toes will be perfect. During this procedure continue using the B₂ religiously. Initially $\frac{1}{2}$ in. perches should be placed in the brooder. Use dowel pins gradually increasing the diameter as the chick grows. Chicks are kept in the brooder until they are nearly grown.

During this growing period the size of the light bulb must be decreased gradually to 15 watt minimum and the marbles can be removed from the waterer. Cleanliness must be maintained at all times. Paper towels must be changed when necessary and the waterer changed and cleaned daily. The young birds remain tame but fly out of the brooders when they are opened. It is important, therefore, that the brooders be kept in a room or building so that the chicks cannot escape. Mealworms fed individually keep the birds tame. When grown, the birds are transferred to roofed wire bottom cages with shelter in them. Groups of these peacock pheasants can be then introduced together into a large cage and can be kept together for months without problems. Of course, when the breeding season begins fighting will occur and the birds must be separated into pairs or pens of separate sexes and species.

In northern climates peacock pheasants must be kept indoors in the winter if temperatures are lower than 35° F. (1.6° C.). Their life expectancy sometimes exceed 10 years.

PRODUCTS MENTIONED IN THE TEXT

Purina Gamebird Startina and Purina Trout Chow manufactured by Ralston Purina Company, St. Louis, Mo., U.S.A.

Cosa-Terramycin—Brand of Vitamin enriched, water-soluble tetracycline manufactured by Pfizer Laboratories, N.Y., N.Y., U.S.A.

ACKNOWLEDGMENTS

Thanks must go to Dr. and Mrs. Michael E. Dam, Jr., of Haines City, Florida, as most of the procedures for rearing peacock pheasants mentioned in the text were developed by them.

* * *

FOSTERING OF PARROT EGGS AND CHICKS

By GEORGE A. SMITH (Peterborough, England)

The male of my pair of Port Lincoln Parakeets is very tame. (For the purist in taxonomic matters they actually are *Barnardius zonarius dundasi* and not *B.z.zonarius*). This otherwise very pleasing tameness has made him something of a nuisance when breeding. For I cannot enter the flight without being attacked unless I go to the bother of carrying a black catching-net. The white net is practically useless as a prophylactic for it is the blackness which frightens him more than the fear of being caught. And each morning as I do my rounds of giving tit-bits of fruit and protein I have to spend too much time making him pursue my left hand—outside the wire—while my right hand sneaks inside and stealthily changes the pots. Sadly his worse fault, which I believe comes from this almost complete lack of fear, is to courageously climb right to the bottom of the very long and dark nest-box where, if he can, he eats the eggs.

He developed his liking for eggs two days before the first clutch was due to hatch and the two eggs that I rescued were badly cracked. However the repairs made with transparent nail varnish held and one hatched under Indian Ringnecks, *Psittacula krameri*, but it died because they would not feed it, although they are excellent parents with their own chicks. The Port Lincoln managed to eat all the second round after his wife had sat for a full week. But from the third clutch I managed to take three eggs. Two were given to Rock Pebblars, *Polytelis anthopeplus*, and the other put under Redrumps, *Psephotus haematonotus*. All three hatched.

The differences between Port Lincoln chicks and those of Rock Pebblars are very slight. It is mainly that the Rock Pebblars have slightly more white down; have less pronounced barbs to the arrow-shaped tip of the upper bill; and they may be fractionally larger and perhaps slightly less helpless. Indistinct as these differences are the hen Rock Pebblar had no difficulty in distinguishing them for, though she continued to brood the mixed babies, she did not feed the Port Lincolns and one died before I realised this neglect. The second hatched chick was rescued only just in time. At about two days old he was extremely weak and, completely starved of food, he lay partly immersed in a trio of fat Rock Pebblar chicks each with a massive, filled crop. Only one of these well-fed chicks was older than the neglected Port Lincoln. The starved chick was artificially fed with "Farex" and milk and then, not wishing to become its wet-nurse, was put with the only available parent parrots, which were quite inexperienced Bourke's Grass-parakeets, *Neophema bourkii*, with week-old young. They accepted it immediately. After two more days the third egg under the Redrumps hatched and I waited two days to make positively certain that they were feeding it before I gave them the now seemingly enormous "Cuckoo" Port Lincoln from the Bourke's nest. As a further

experiment I also gave an incubating Yellow-fronted New Zealand parrakeet, *Cyanoramphus auriceps*, two Splendid Grass-parrakeet, *N. splendida*, eggs; and a Barraband, *Polytelis swainsonii*, those of a Gold-mantled Rosella, *Platycercus eximius*. These two foster-parents had previously proved themselves to be good parents. The fostered eggs hatched just before, or in the same period as the fosterers' own eggs, yet like the Ringnecks and Rock Peblar, they would not feed the fostered chicks although they did not neglect their own.

In the available literature there are many accounts of different parrot species successfully rearing quite alien forms. My personal knowledge includes Redrumps (whose young have thick down and fledge when four or five weeks old) hatching and rearing Indian Ringnecks (whose chicks are born naked and spend almost twice as long in the box) and Budgerigars, *Melopsittacus undulatus*, raising Quaker Conures, *Myiopsitta monachus* until they became too large for the foster parents' feeding ability. (Budgerigar chicks are naked, Quakers are downed and have, like the majority of New World parrots, huge basal swellings to the upper mandible). From the literature we might especially note Fischer's Lovebirds, *Agapornis personata fischeri*, successfully rearing a Splendid Grass-Parrakeet with some of their own chicks (Boosey 1934); Bourke's rearing Princess of Wales', *Polytelis alexandrae* (Harvey 1933); and Brown-throated Conures, *Aratinga pertinax*, fostered from an early age by Budgerigars (Williams 1907). Failures are not often given: West (1955) found that his Cockatiels, *Nymphicus hollandicus*, would not feed Crimson-wings, *Aprosmictus erythropterus*.

Dilger (1960) reports that once Lovebirds, *Agapornis* spp., have had experience of feeding their own youngsters then the sexually differentiated forms he studied—Madagascar *cana*; Abyssinian, *taranta*,—which have white-downed young refused to feed the fresh-hatched chicks of the like-sexed Lovebirds—and vice-versa. It might be noted that the species in which the sexes are similar—Peach-faced, *roseicollis*; Masked, Black-cheeked, Nyassa, Fischer's. *personata* ssp.—have a slightly more dense down with a pink rather than a white colour. But should the parent Lovebirds have had no experience of raising young then they would feed chicks of the other group. He found, by experiment, that when Peach-faced Lovebirds foster-reared as their first brood white-downed species of Love-birds they would not subsequently feed their own pink-downed chicks.

Dilger did not suggest how it is that Lovebirds can distinguish their own offspring. It is unlikely they do it by sight. The difference between pale pink and white would not be made out in the dim light of a nest chamber. And, as Dilger notes, although experienced breeding Lovebirds will not feed fresh hatched chicks of "opposite" forms this discrimination does not apply to older chicks. That is when the visual differences between the chicks are only too obviously apparent. I know of Cockatiels

accepting half-grown Bourke's, and Gold-mantled Rosellas, put in the nest with their own young; yet when subsequently offered fresh-hatched chicks in their next breeding cycle let them die unfed. It is my experience that older chicks, provided they are not too close to fledging, get accepted while in the box.

I believe that this discrimination against alien species comes because a parrot experienced in rearing chicks has become attuned to react quite specifically to the noises made by their hungry chicks. If the subsequent chicks cannot give a correct sound then the parent is unable to react and feed it. Neglect is therefore not "purposeful" but a psychological inability to react to "strange" food-begging calls. If this is a correct hypothesis then it must follow, from Diliger's experiment with the peach-faced Lovebirds, that the first experience that Lovebirds (and most parrots?) have of hatching and rearing their chicks "imprints" them with their specific chick noise for it seems not to be a hereditary knowledge but something that has to be learnt. Following such imprinting the parents can only respond to this or to very similar sounds.

The explanation for the development in parrots of this fine sense of discrimination, to the food soliciting calls of very young chicks, is that without it the smaller and younger members of a parrot brood would probably die of starvation because of excessive attention being given by the parents to the stronger, more actively soliciting, elder chicks.

Parrot hens usually begin the incubation of their eggs before the clutch is complete. The youngest chicks, if they are to survive, must have a greater allure for the parents to feed them than the elder chicks (Smith 1972). The eldest members of a brood, especially with the fast growing, ground-feeding, forms, can be almost of adult size and weight, with feathers, capable of maintaining their own body heat and are fed largely by actively soliciting food from the parents. While the freshly hatched youngest would be less than 10% of adult weight, completely blind, easily cooled and almost absolutely incapable of any physical movement except to jerk its head vertically while being fed with its beak held by the parent and of shuffling into sources of heat, the rest of the brood consisting of various intermediates between these two conditions. Elder chicks sound very noticeably different from the babies. Their food soliciting call makes the parents regurgitate and feed, but it is not done with the solicitude they show for the very young. I have repeatedly observed that parrots excited enough to regurgitate food—and some parrots seem to get literally sick with excitement—attempt to feed a noticeable projection, which is usually the bill of another bird. But isolated, sexually active individuals can be seen to feed projecting twigs, knots of wood, spots of paint and even their feet. I have seen a male Splendid call his wife to the hole of the box to be fed and then proceed to feed a projecting nail, rather than her, presumably because it offered more stimulus than her tubby bill. Oddly she swallowed after each "feeding" just as if he

had fed her. An older chick waggling its head and moving its face purposely towards the parent is easily seen and fed for it provides an attracting feature—the bill which in all nestling parrots is light-coloured. But the very young can barely raise their heads. They have to lie because it is source of heat, immured beneath a cluster of their older brethren. They must therefore have a means of attracting the parent hearing it to purposely seek out the source of such a noise, regurgitate pick up its beak and feed it. The noise must therefore be quite distinctive from older chicks and, to a parrot, be most plaintive. It is therefore such an important feature in the successful rearing of large broods that it has become selectively attuned to a very high level of discrimination.

If this is so, and the evidence seems to point that way, then people desirous of fostering eggs of parrots would be advised, if the parrot species are quite dissimilar, to use inexperienced rather than experienced hens for the purpose. Secondly valuable hens that have, for some reason or other, no success in hatching their first round should not be used as fosters for alien forms in case they become imprinted to these and will not, in subsequent rounds, feed their own offspring.

REFERENCES

- BOOSEY, E. J. 1934. Breeding of the Splendid Grass Parrakeet for the first time in Europe. *Avicult. Mag.*, (4) 12: 289-292.
 DILGER, W. C. 1960. The comparative ethology of the African parrot genus *Agapornis*. *Z. Tierpsychol.*, 17: 649-685.
 HARVEY, S. 1933. Queen Alexandra Parrakeets and their strange behaviour in captivity in Australia. *Avicult. Mag.*, (4) 11, 227-228.
 SMITH, G. A. 1972. Nesting and nestling parrots. *Avicult. Mag.*, 78: 155-164.
 WEST, D. W. 1953. Breeding results for 1953 in California. *Avicult. Mag.*, 59: 160-166.
 WILLIAMS, C. H. 1907. Brown-throated conures. *Avicult. Mag.*, New ser. 5: 126-127.

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NEWS FROM THE BERLIN ZOO

By PROFESSOR DR. HEINZ-GEORG KLÖS

This summer we have been lucky in that in the incubator there were hatched 11 Common Rheas (*Rhea americana*), 7 White Rheas and 1 South African Ostrich (*Struthio camelus australis*). Our pair of Australian Silver Gulls (*Larus novaehollandiae*) had another 2 chicks. In the Flamingo-colony, after several hatchings in early summer, there were breeding successes with another European Flamingo (*Phoenicopterus ruber*) and eight Chilean Flamingos (*Phoenicopterus chilensis*).

In addition to the above mentioned species the following birds were hatched:

2 Pacific Brent Geese (*Branta bernicla orientalis*), 2 Black-backed Radjah Shelducks (*Tadorna r. radjah*), 13 European Greater Scaups (*Aythya fuligula*), 4 North American Wood Ducks (*Aix sponsa*), 2 Rock Doves (*Columba livia*), 2 Olive Pigeons (*Columba arquatrix*), 2 Crimson-winged Parrots (*Aprosmictus e.erythropterus*), 4 Grey-breasted Parrakeets (*Myiopsitta monachus*) 1 Fairy Bluebird (*Irena puella*).

New arrivals:

1 Bennett's Cassowary (*Casuarius bennetti*), 1 Little Bittern (*Ixobrychus minutus*), 2 Indian Whistling Ducks (*Dendrocygna javanica*), 4 Fulvous Tree Ducks (*Dendrocygna bicolor*), 2 Lesser White-fronted Geese (*Anser erythropus*), 2 Ross's Geese (*Anser rossii*), 1 Dark Canada Goose (*Branta canadensis occidentalis*), 1,1 Abyssinian Blue-winged Geese (*Cyanochen cyanopterus*), 1 Ruddy-headed Goose (*Chloëphaga rubidiceps*), 1 Ashy-headed Goose (*Chloëphaga poliocephala*), 4 Chilean Teals (*Anas f. flavirostris*), 2 Versicolor Teal (*Anas v.versicolor*), 3 Cape Teal (*Anas capensis*), 2 Cinnamon Teal (*Anas cyanoptera*), 0,1 Australian Shoveler (*Anas r.rhynchotis*), 2,2 European Eiders (*Somateria m.mollissima*), 1 Sacred Ibis (*Threskiornis aethiopica*), 1,1 Green Peafowl (*Pavo muticus*), 1 Thick-billed Green Pigeon (*Treron curvirostra nipalensis*), 2 Emerald Doves (*Chalcophaps indica*), 1 Rueppell's Griffon (*Gyps rueppellii*), 1 Long-eared Owl (*Asio o.otus*), 2 Budgerigars (*Melopsittacus undulatus*), 2 Blue-crowned Motmots (*Momota m. lessonii*), 0.2 Great Indian Hornbills (*Buceros bicornis*), 1 Blue-throated Barbet (*Megalaima asiatica*), 2 Black-necked Araçaris (*Pteroglossus aracari*), 4 Cuvier's Toucans (*Ramphastos cuvieri*), 1,0 Bare-throated Bellbird (*Procnias nudicollis*), 3 White-crested Jay Thrushes (*Garrulax leucolophus*), 1 Collared Jay Thrush (*Garrulax picticollis*), 2 Saffron Finches (*Sicalis flaveola*), 2 Paradise Tanagers (*Tangara chilensis*), 2 Scarlet Tanagers (*Ramphocelus bresilius*), 3 Golden Tanagers (*Tangara arthus*), 1 Blue-grey Tanager (*Thraupis episcopus*) 1 Goldfinch (*Carduelis c. carduelis*), 4 Grey-headed Silver Bills (*Odontospiza caniceps*), 2,2 Long-tailed Grassfinches (*Poëphila acuticauda*), 2,2 Star Finches (*Bathilda ruficauda*), 1,1 Green-backed Twin Spots (*Mandingoa nitidula*), 5 Malabar Mynahs (*Temenuchus malabaricus*), 2 Common Mynahs (*Acridotheres tristis*).

* * *

AVICULTURAL SOCIETY FIRST BREEDING MEDALS AND CERTIFICATES, mid-1970 to mid-1973

By C. J. O. HARRISON

Although there is usually an indication at the end of an article in the magazine if it is thought that the account in question is a record of the first breeding of a species in Great Britain or Northern Ireland, it is not always clear if an award has been made; and I have been asked to summarise the more recent awards. I have taken as a starting point here those breedings for which no award had been made by the end of 1970, although the account may have been published in that year. In the list below the year given is that of publication of the account in the magazine.

Medals awarded.

- 1970. (latter half). Lemon-rumped Tanager, *Ramphocelus icteronotus*; Mrs. K. M. Scamell. Ornate Lorikeet, *Trichoglossus ornatus*; J. Bunker. Fawn-naped Tanager, *Tangara ruficervix*; H. Murray.
- 1971. Great Grey Shrike, *Lanius excubitor*; M. D. England. Spotless Starling, *Sturnus unicolor*; K. R. Semple. Malabar Starling, *Sturnus malabaricus*; R. Franklin. Black-headed Caique, *Pionites melanocephala*; G. A. Smith. Rufous-backed Shrike, *Lanius schach*. M. D. England.
- 1972. Jerdon's Starling, *Sturnus burmanicus*; R. Franklin. Blue-streaked Lory, *Eos reticulata*; R. W. Phipps. Hawk-headed Parrot, *Deroptyns accipitrinus*; Mrs. N. Howard.
- 1973. (first half). Red-fronted Barbet, *Tricholaema diadematum*. M. D. England. Rook, *Corvus frugilegus*; P. R. Richards. Ross's Touraco, *Musophaga rossae*; N. R. Steel. Collared Scops Owl, *Otus bakkamoena*; A. Smith.

Certificates of Merit.

- 1970. (latter half). Alpine Chough, *Pyrrhocorax graculus*; Norfolk Wildlife Park (P. Wayre). Grey Touraco, *Corythaixoides concolor*; Jersey Zoological Park (D. G. Roles).
- 1972. Mexican Green Jay, *Cyanocorax yncas*; Thick-billed Euphonia, *Tanagra lanirostris*; Jersey Zool. P. (D. G. Roles). Wattled Starling *Creatophora carunculata*; Harewood Bird Garden (P. B. Brown). Abyssinian Ground Thrush, *Geokichla piaggiae*; Woodland Kingfisher, *Halcyon senegalensis*; Winged World (B. S. Ward). Hispaniolan Amazon, *Amazona ventralis*; Jersey Wildlife Preservation Trust (A. F. Gates).
- 1972. D'Arnaud's Barbet, *Trachyphonus darnaudii*; Toucan Barbet, *Semnornis ramphastinus*; Winged World (B. S. Ward).
- 1973. (first half). Blue-backed Manakin, *Chiroxiphia pareola*; London Zoo (P. Olney). Red-headed Bunting, *Emberiza bruniceps*;

Chester Zoo (W. H. Timmis). Schalow's Touraco, *Tauraco chalowi*; Jersey Wildlife Pres. Trust. (D. G. Roles). Victoria Crowned Pigeon, *Goura victoria*; Bristol Zoo (M. Sherborne).

It will be noted that some breedings, thought at first to be first records, are omitted from the above list. Subsequent letters in the magazine (vol. 73 : 48) indicated that the breeding of the Lesser Sulphur-crowned Cockatoo, *Cacatua sulphurea sulphurea* by C. Smith was not the first, and we were notified of an earlier breeding of the Perfect Lorikeet, *Trichoglossus euteles*, to that of K. Russell; by I. G. Hale in 1969. Notification was also received of earlier breedings of the Crimson-rumped Waxbill, *Estrilda rhodopyga*, and Chester's claim for the Yellow-breasted Bunting, *Emberiza aureola*, has also been queried.

The Gold Coast Touraco, *Tauraco persa*, had already been bred under the name Senegal Touraco by Captain H. S. Stokes in 1932. The oversight here was a simple one, a list being lacking at the time, but more problems are raised when taxonomic revisions of birds result in forms which retain different English names, and which were previously regarded as separate species, being grouped as subspecies of a single species. The rules of the Society allow the award of a medal for the first breeding of a **species**. Other medals may be awarded at the council's discretion for breedings of special merit, but the award for a species must be for what is regarded as a species in the current consensus of taxonomic opinion.

This rule seems to have been overlooked in the past in the case of some parrot breedings, and had led to some confusion, especially since many subspecies are not clearly defined entities. Two breedings during the period under discussion are affected by this. The Double Yellow-headed Amazon Parrot, bred by C. Smith, is now regarded as a subspecies, *Amazona ochrocephala oratrix*, of the Yellow-headed Amazon, the nominate form of which, the Yellow-fronted Amazon, had already been bred by Mr. Smith and for which he had received the Society's medal. The Lesser Patagonian Conure, *Cyanoliseus p. patagonus*, bred at Chester Zoo, is regarded as a subspecies of a species including the Greater Patagonian Conure, *C. p. byroni*, which had been bred in 1963 by W. R. Partridge. Under the rule these two breedings do not therefore qualify as first breedings of a species.

The breeding of Weber's Lorikeet, *Trichoglossus haematodus weberi*, by R. T. Kyme, for which a medal was awarded in 1971 is therefore not an award for a breeding of a species, but a discretionary award for the first breeding of a well-defined isolate of a species of which other subspecies had already been bred. I personally feel that in instances where well-defined subspecies are bred the onus is on the breeder to indicate the degree of difference which he feels is involved, and which might justify an award; although this is difficult in view of the small number of birds usually involved, which tends to exaggerate the individual differences in behaviour which are normally apparent. The final decision, right or wrong, must rest with the Council.

I regret that the breeding at Birdworld of the Casqued Hornbill *Bycanistes subcylindricus*, which falls within this period did not, due to an oversight of mine, come before the Council at its last meeting and must await a later meeting for consideration.

COUNCIL MEETING

A Council Meeting was held on 8th October, 1973, at 32 Bruton Place, London, W.1. The following members were present:

Miss P. Barclay-Smith in the Chair.

Mr. P. B. Brown, Dr. C. J. O. Harrison, Professor J. R. Hodges, Mr. F. Meaden, Mr. H. Murray, Mr. P. J. Olney, Mr. D. Risdon, Mr. R. C. J. Sawyer, Mr. N. R. Steel, Mr. J. J. Yealland.

Mr. H. J. Horswell (Hon. Secretary and Treasurer), Mrs. M. Haynes (Assistant Hon. Secretary).

AWARDS

Certificates of Merit

Woodland Kingfisher, *Halcyon senegalensis*. Winged World, 1971.

Bluebacked Manakin, *Chiroxiphia pareola*. Zoological Society of London, 1973

Red-headed Bunting, *Emberiza bruniceps*. North of England Zoological Society, 1973.

Victoria Crowned Pigeon, *Goura victoria*, Bristol Zoological Society, 1973

Schalow's Touraco, *Tauraco schalowi*. Jersey Wildlife Preservation Trust, 1973.

Casqued Hornbill, *Bycanistes subcylindricus*. Birdworld, 1972.

Medals

Rook, *Corvus frugilegus*. P. R. Richards, 1973.

Ross's Touraco, *Musophagus rossae*. N. R. Steel, 1973.

Red-fronted Barbet, *Tricholaema diadematum*. M. D. England, 1973.

Collared Scops Owl, *Otus bakkamoena*. H. Smith, 1973.

H. J. Horswell,
Hon. Secretary.

SOCIAL MEETINGS—1974

Wine Buffets will be held on the evenings of 21st January, 20th May and 21st October, 1974.

The Annual Dinner will be held on 16th September, 1974.

Details of all these events will be notified to British Members at the appropriate time via insertions in the AVICULTURAL MAGAZINE. Foreign Members who will be in Britain on any of the above dates and would like to attend, should apply to the Hon. Secretary for details.

It is also hoped to arrange at least one visit to a collection during the year.

NEWS AND VIEWS

The three young Sun Conures hatched by A. V. Marques' pair in their second nest have all been successfully reared making a total of five youngsters for 1973.

* * *

J. J. Postema, Gieterveen, Holland who possesses one of the largest and most comprehensive collections of Australian (mainly) Parrakeets in Europe has had another very successful breeding season. In 1973 the following were reared in his aviaries: 8 Eastern Rosella, 12 Blue-checked, 5 Mealy, 12 Brown's, 8 Pennant's, 12 Yellow Rosella, 4 Princess of Wales, 3 Rock Peplar, 3 Barraband's, 4 Cloncurry, 3 Barnard, 3 Crimson-winged, 5 Hooded, 10 Splendid, 6 Turquoise and 6 Red-fronted New Zealand Parrakeets. In addition several mutations have been bred including 6 Blue Masked and 3 Lutino Fischer's Lovebirds, 6 Lutino Ring-necked Parrakeets and about 80 Cockatiels of different colour varieties including White, Pied and "Pearled."

* * *

Mats Tell, Ljungbyhed, Sweden reports his breeding results for 1973. 'Despite a very hot and dry summer, most of my birds have nested. However, some of my old reliable pairs failed and so the results were not the very best. Here is the list: 3 Silver-eared Mesias (second generation), 3 Blue-winged Sivas, 2 Redrump, 20 Bourke's and 2 Aymara Parrakeets. There were no Cardinals as I had no room for them. Nevertheless, two young females bred last year laid many eggs from the perches, although I kept them separated from the cocks.'

* * *

During the period 1st May-31st August, the following hatchings were recorded at the Jersey Wildlife Preservation Trust: 35 White Eared Pheasants, 3 Brown Eared Pheasants, 3 Blue Eared Pheasants, 2 Palawan Peacock Pheasants (making a total of 3 in 1973), 1 Satyr Tragopan, 2 Red-necked Francolin, 5 Hawaiian Ducks, 6 Laysan Teal, 9 Carolina Wood Ducks, 24 Mandarin Ducks, 6 Red-billed Tree Ducks, 6 Common Mergansers, 2 Hispaniolan Parrots, 3 Thick-billed Parrots, 6 Rothschild's Mynahs (making a total of 9 in 1973) and 3 Snowy Owls. One of the Palawan Peacock Pheasants was reared by its parents in the new Palawan Peacock Pheasant range of aviaries.

Several cases of ornithosis have been diagnosed in human patients recently and almost invariably the source of the infection has been traced to newly imported South American Parrots. Some clinicians believe that the only solution to the problem is the immediate reintroduction of restrictions on the importation of psittacine birds. Most bird lovers would probably welcome such a move not only on medical but also on humanitarian grounds. There can be little doubt that the appalling conditions in which parrots and other birds are being imported and maintained on many dealers' premises are probably the fundamental cause of the present situation.

J. R. H.

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REVIEW

CURASSOWS AND RELATED BIRDS. By JEAN DELACOUR and DEAN AMADON. New York: The American Museum of Natural History. 1973. Price 20 dollars.

The game birds of the family Cracidae are found in the tropics and sub-tropics of the Americas, from the border of Texas to northern Argentina. They are much more aboreal than the pheasants and not so brightly coloured. Many, however, are elegant in shape and have brightly coloured skin ornaments, wattles and crests, on the head. The variation in plumage between a number of different species is often difficult to detect and their classification has had to be thoroughly revised. This has been carried out by the authors, with the help of Dr. C. Vaurie who had previously published detailed studies on this subject.

This book, thanks to the Phipps foundation, is profusely and beautifully illustrated. Both the coloured plates and black and white drawings are by Albert E. Gilbert, and in addition there are four colour plates by George Miksch Sutton and one by David Reid-Henry, three skilled artists whose work would be hard to surpass, and results in a magnificent volume of great attractiveness.

The two distinguished authors give a wealth of documentation of the Curassows, Guans and Chalchalacas, in particular with regard to their characteristics and habits.

The records of these birds in captivity and their breeding as well as information on their care is of especial interest and value to aviculturists

P. B-S

* * *

NOTES

BREEDING OF THE BLUE-WINGED PITTA, *PITTA MOLUCCENSIS*,
AT THE WILDFOWL TRUST

In an article on the Wildfowl Trust published in the magazine recently Mr. T. Johnstone casually mentioned the breeding of the Blue-winged Pitta, *Pitta moluccensis*, in the tropical house. Since, as far as we are aware, there are no records of successful breedings of any species of pittas in Britain as yet, we asked for more details and Mr. Johnstone has supplied the following data—"First nest building commenced on 21st May 1972; first egg on 2nd June. Four eggs were taken away on 28th June and found to be clear. The second nest was built quickly on 30th June. Four eggs were laid by 3rd July. Two hatched on 22nd July. They left the nest on 7th August and one was found dead in the pond on 10th August. The second young one survived. Both parents incubated, brooded and fed the young. There are other pittas and Sun Bitterns in the house, and the adult female Blue-winged Pitta was found dead with a head injury some days after the young hatched."

* * *

HON. TREASURER'S REPORT

We have published this year a Balance Sheet as well as a full Income and Expenditure Account. From the latter you will see that your Society made a loss of £308.42 last year due to rising costs and a fall in Membership.

It has been decided not to increase the Membership fee but to effect economies mainly in the production of the Magazine which we are confident can be done without any fall in the high standard which has been maintained for so long.

We would ask all Members to make every effort to interest others in joining our Society. We would also welcome donations which can be used to increase the number of coloured plates printed or for general purposes, according to the donor's wish. The Society is registered as a charity and a donation in the usual form of covenant will enable us to reclaim tax. This does not apply to subscriptions.

The Balance Sheet, printed for the first time, takes into account printing costs unpaid at the close of the year. The Society has for many years paid its printer in arrears and it has been decided to sell our Bonds to clear up this situation and enable us to renegotiate our printing. This will leave the Society with very little reserves but we are confident that these can be built up again.

I wish to acknowledge a generous anonymous donation of £100 to assist us in carrying out the proposed changes.

H. J. Horswell,
Hon. Treasurer.

INCOME AND EXPENDITURE ACCOUNT

For the Year ended 31st December, 1973

Year ended	Year ended
31.12.71.	31.12.71.
To: Printing & Publishing Magazine 2667.15	421.53 By: Magazine & Book Sales . .
288.00 Colour Plates 74.50	2352.28 Subscriptions & Donations . .
144.17 Sundry Printing & Stationery . . 117.40	117.71 Interest on Government Stocks
222.40 Postages 238.66	29.90 Premium on Redemption &
— Medals and Awards 18.56	Conversion of Government
225.00 Honoraria 225.00	Stocks 3.30
19.16 Editor's Expenses 17.96	Cheese & Wine Function
21.00 Preparation Index —	Receipts 81.50
— Hire of Meeting Room 25.00	Less: Costs borne by Society . . 81.50
— Hire of Library Facilities 20.00	Deficit for the Year —
— Sundry Expenses 5.00	308.42
— — — — — 3409.23	
£3809.73	£3809.73

As at 31st December, 1972

23 I

We have examined the above Balance Sheet and accompanying Income and Expenditure Account together with the books and vouchers in the hands of the Hon. Treasurer and in our opinion the same are correctly drawn up and in accordance therewith.

11th April, 1973

Signed. WALTER H. OURY & Co.
Chartered Accountants,
38, High Street,
Maidenhead SL6 1QF.

EDITORIAL

On January 1st, 1974 I shall be replaced as Editor of the AVICULTURAL MAGAZINE by John Yealland. In this my farewell and expression of thanks to the many contributors who have made my task so gratifying and enjoyable during the 34 years as Editor, I think perhaps I can best summarize my experiences by quoting briefly a few paragraphs from the Editorial I wrote in the 75th Anniversary Supplement published in November 1969, Volume 75, No. 6. After an account of the early days and problems of the Magazine I wrote:

"The situation remained difficult till 1925, after which the Magazine went from strength to strength owing to the great ability and drive of Mr. David Seth-Smith who had served as Editor (sometimes with a co-Editor) from 1901 to 1934, with only an interval of 10 years from 1910-1920.

"It came, to say the least of it, as a surprise when, at an ornithological meeting in 1938 Mr. Alfred Ezra, Monsieur Jean Delacour and Mr. David Seth-Smith came up to me and said, 'We have an additional job for you, we want you to edit the AVICULTURAL MAGAZINE'. 'But I can't', I replied, 'I am not an aviculturist'. 'No matter we will help you.' And that is how it all began. Thanks to the efforts of all three I gradually graduated to being an aviculturist."

Shortly afterwards the Second World War broke out.

"Like a snail with its shell I took the Magazine with me during my various vicissitudes of the war—typing on rickety tables in billets—correcting proofs during rare occasions when there was a lull during night duty at the Foreign Office, and later finding even the pasting-up of the pages a relief and relaxation from the underground existence deep in the Corsham caves in the production of a new secret aircraft engine. When I lost my home and all my possessions by a direct hit during the Battle of Britain the editorial headquarters of the Magazine were literally a large suitcase.

"During 1940 the standard and size of the Magazine were maintained, but at the end of that year with the fall in income and rise in cost of production it was essential that economy should be made and it was therefore decided to publish the Magazine every second month. With the progress of the war the pinch became tighter, particularly with the advent of paper rationing, and the Magazine became very slim.

"Since the war the Magazine has gradually built up again though with a difference. Most of the great collections of the past have gone, but a new pattern has appeared in the bird parks open to the public . . . which have proved that they can give much interesting information and achieve first breedings, as well as serve as an attraction for the public."

It has always been my aim to maintain a balance between scientific and popular interests and the fact that at the present time articles are contributed from all over the world is gratifying evidence of the wide scope of our journal. This is due to all those who have made it possible, and I would specially like to thank the printers—Messrs. Warren & Sons Ltd., to bring the Magazine to the high standard it now enjoys. Though it would be invidious to mention by name those who have given the greatest help they themselves will realize how much is owed to them and how grateful their Editor is for their unfailing support.

Mr. Yealland will undoubtedly maintain the standard of the Magazine and in future all communications should be addressed to him at: Stoneham Cottage, Cemetery Road, Binstead, Isle of Wight.

PHYLLIS BARCLAY-SMITH.

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* Denotes a coloured plate.

THE AVICULTURAL MAGAZINE

The Magazine is published bi-monthly, and sent free to all members of the Avicultural Society. Members joining at any time during the year are entitled to the back numbers for the current year on the payment of subscription.

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Dr. Colin Harrison, 22 St. Margaret's Close, Berkhamsted, Herts.

In future the AVICULTURAL MAGAZINE will be distributed by the Avicultural Society and members should address all orders for extra copies and back numbers to the Hon. Secretary and Treasurer, 20 Bourdon Street, London W1X 9HX.

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NEW MEMBERS

The 11 candidates for Membership in the September-October 1973 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

CANDIDATES FOR MEMBERSHIP

W. C. CRAWFORD JNR., 3945B, Brittany Circle, Bridgeton, MO., 63044, U.S.A.
DR. W. A. DUNSON, The Pennsylvania State University, 208 Life Sciences 1.,
University Park, Pennsylvania, 16802, U.S.A.
JEAN-PIERRE PASTEELS, Mechelsestraat 61, B-1800, Vilvoorde, Belgium.
J. M. SMITH, Rosemount, Madeira Lane, Greenock, Renfrewshire, PA16 7UL.
A. T. WORRALL, 5, Palace Mansions, Palace Road, Kingston-on-Thames.
JAN E. RAASTAD, Rådyrveien 7B, Oslo, 5, Norway.

CHANGES OF ADDRESS

MRS. D. BALCON, to "Mirage", Plot 1, Bungalow, Cr: Mill Lane, Tye Green,
Braintree Road, Braintree, Essex, CM7 8HX.
MR. D. GAINEY, to 368 London Road, Deal, Kent.
MR. J. LEESE, to Burcote Bungalow, Burcote, Bridgnorth, Salop.
R. M. MARTIN, to Padstow Bird Gardens, Fentonluna Lane, Padstow, Cornwall.
D. C. COLES, to c/o Adelaide Zoological Gardens, Frome Road, Adelaide S.,
Australia, 5000.

MR. J. GILLEN, to 16, Old Antrim Road, Ballymene, Co. Antrim, N. Ireland.
P. H. MAXWELL, F.Z.S., M.B.O.U., The Chalk Lane Hotel, 1, Woodcote End, Epsom,
Surrey.
MR. D. R. COLLINSON, to "The Spinney", 3 Clonard Way, Hatch End, Middlesex,
HA5 4BT.

CHANGE OF TITLE

MR. K. E. L. SIMMONS, to Doctor K. E. L. Simmons, M.B.O.U., M.S.C., PH.D.
SIR PETER SCOTT, C.B.E., D.S.C., L.L., D.M.A., F.Z.S., M.B.O.U.

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